



American.



African.



Native American.



European.



Chinese.

BUFFON'S
Natural History
 ABRIDGED
A New Edition
 by the Hon. W. Hutton, M. P.
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BUFFON'S NATURAL HISTORY.

PART I.

CHAPTER I.

Of attraction—repulsion—elements—heat—~~air~~—water—earth—metals and mines—the form, composition, &c. of the earth.

THE known powers of nature may be reduced to two primitive forces, *attraction* and *repulsion*. The first is the cause of gravity ; in other words, it is by the attraction which exists between the mass of earth, and all bodies near its surface, that every thing has a natural tendency downward, that all matters fall to the ground, &c. The second principle is the cause of elasticity, and prevents the matter of the universe from becoming a solid mass, by counteracting the efforts of attraction.

The most ancient authors have agreed in supposing that there are four distinct species of elementary or original matter, *viz.* fire, air, water, and earth.

There is reason to believe that FIRE or HEAT is the only permanently elastic substance in nature. We see that when it penetrates the pores of any body, it uniformly expands it. A bar of iron is lengthened by being heated, metals and other substances are melted by it, and water is converted into vapour. There is therefore ample ground for believing that all fluidity is the effect of heat. The natural state of water is ice ; and air itself, were there any means of producing a sufficient degree of cold, might probably be reduced to a solid mass.

As all fluidity has heat for the cause, by comparing certain substances together, we find, that much more heat is requisite to keep iron in fusion than gold, much more to keep gold in that state than tin, much less to keep wax, much less to keep water, much less for spirit of wine, and

at last exceedingly less for mercury ;* since it only becomes solid at 187 degrees below that point at which water freezes ; this matter, mercury, would be therefore the most fluid of all bodies, if air was not still more so. Now, what does this fluidity greater in air, than in any other matter, indicate ? It appears to indicate the least degree of adherence between its constituting parts, that can be conceived, by supposing them of such a figure as only to be touched at one point. The greater or lesser degree of fluidity does not however, indicate that the parts of the fluid are more or less weighty, but only that their adherence is so much the less, their union so much the less intimate, and their separation so much the easier. If a thousand degrees of heat are required to keep water fluid, it, perhaps, will only require one to preserve the fluidity of air.

It is doubtful whether LIGHT consists of the same matter with elementary fire or not. The great source of light is found to be the sun, from whose body it is projected in the space of seven minutes and a half ; and as the sun is computed to be distant 36 millions of miles, the light must of consequence travel at the rate of about 80,000 miles in one second of time.

Light may be reflected as well as projected. The light which we receive from the moon is only reflected as from a mirror. The light of the sun is 300,000 times stronger than the light of the moon.

AIR is the food of fire ; for by uniting with combustible matters, the air is destroyed or condensed, and the fire which kept it in a state of elasticity is therefore emitted. No combustibles will burn in vessels from which the air is excluded.

It is vulgarly supposed, that flame is the hottest part of fire, yet nothing is worse founded than this opinion ; for the contrary may be demonstrated by the easiest and most familiar experiments. Offer to a straw-fire, or even to the flame of a lighted faggot, a cloth to dry or heat, double and treble the time will be required to give it the degree of dryness or heat, that would be given to it by exposing it to a brazier without flame, or even to a very small heat. Flame has been exceedingly well characterized by Newton, when he defined it a burning smoke ; and this smoke, or

vapour, which burns, has never the same quantity, the same intensity of heat, as the combustible body from which it escapes. Only by being carried upwards, and extending itself, it has the property of communicating fire, and of carrying it further than the heat of the brazier does, which alone might not be sufficient to communicate it when even very near.

Air is not only perceptible to the touch, but is also found by experiment to have weight; a bottle emptied of its air is much lighter than before, and by computations founded on this experiment, it is known that a square foot of air generally weighs something more than an ounce. The spring of air is shewn in many easy experiments. A blown bladder, for instance, if pressed down, returns to its shape as soon as the pressure is removed. It is evident that, as the air is possessed of weight, the air of our atmosphere must press considerably upon the earth, and all the bodies which are upon it.—Thus, if our hand be placed upon a tube, or air pump, which is emptied of its air, we shall find that it so forcibly adheres, as it were by suction, to the mouth of the tube or pump, that we can scarcely withdraw it. This is however nothing else than the weight of a column of air, the breadth of the hand, which presses upon it, and keeps it down. In the same manner, if the air be exhausted out of a tube, one end of which is immersed in water, the weight of the atmosphere pressing upon the surface of the water will force the water up the empty tube to the height of about 30 feet; and if the tube be immersed in quicksilver, it will force the quicksilver up to the height of 29 inches and a half. A column of air, therefore, of about five miles high, is equal in weight to 30 feet of water, and to 29 inches and a half of quicksilver.* From these experiments it is computed that a man usually sustains a weight of air of about 40,000 pounds.

Like all other matters, it is expanded by an increase of the matter of fire or heat introduced between its particles. Air is therefore said to be rarefied by being heated. The greatest degree of cold that ever has been known, is not sufficient to destroy the spring of air. As the particles of

* On this principle the barometer is constructed, in order to shew the variations in the weight of the air. When it is light the quicksilver in the glass is less pressed by the atmosphere, and when the air is dense and heavy the quicksilver rises. Barometers are used to determine the height of mountains, &c. because the higher we ascend in the atmosphere the less is the weight which presses on the quicksilver. Ed

air are subject to the laws of gravitation, air is likewise expanded or rarefied by a decrease of its mass or quantity; for instance, if a quantity of the superior air be removed, the pressure on that below is proportionably decreased, and from its inherent elasticity, it is rarefied, or the particles removed to a greater distance from each other. Thus also the receiver of an air-pump, after a considerable quantity of the air is pumped out, still continues in reality full of air, though that air is of a thinner consistency.

Air not only contributes to combustion, but also to animal and vital heat. Animals, which have lungs, and which, consequently, respire air, have always more heat than those which are deprived of it; and the more the internal surface of the lungs is extended and ramified in a greater number of cells, the more, in one word, it presents a greater surface to the air which the animal draws in by inspiration; the more also its blood is heated, and the more it communicates heat to all the parts of the body it nourishes; and this proportion takes place in all known animals. Birds, relatively to the volume of their body, have lungs considerably more extended than man or quadrupeds. Reptiles, even those which have a voice, as frogs, have instead of lungs a simple bladder. Insects which have little or no blood, pump the air only by some pipes, and these have little animal heat. Thus, taking the degree of the temperature of the earth for the term of comparison, I have observed, that this heat being supposed ten degrees, that of birds is nearly thirty-three, that of some quadrupeds more than thirty-one and a half, that of a man thirty and a half, or thirty-one; whereas, that of frogs is only fifteen or sixteen, that of fishes and insects eleven or twelve; that is, the least of all, and very nearly the same as that of vegetables. Thus the degree of heat in man and animals, depends on the force and extent of the lungs: these are the bellows of the animal machine; they support and augment the fire according as they are more or less powerful, and their motion more or less ready.

Vegetables, and most insects have, in the room of lungs, only aspiratory tubes or pipes, a kind of tracheas, or wind-pipes, by which they pump up the air which is necessary for them; it is seen to pass in very sensible balls into the pith of the vine; it is not only pumped up by the roots, but often even by the leaves; it forms a part, and a very essential part, of the food of the vegetable, which assimilates, fixes, and preserves it.

It was already intimated, that heat is the efficient cause of all fluidity, and that ice therefore may be termed the natural state of WATER: by adding to the quantity of heat, water is rendered elastic and volatile; that is, is converted into vapour, which is again condensed into water, when the superfluous heat is withdrawn. The force of vapour is almost incredible. It is indeed said, that a single drop of water converted into vapour is capable of raising a weight of 20 tons.

One property of water it is necessary to notice, and that is, that it will always rise to the level of its source, when conveyed in pipes, or other close channels. This property is owing to the pressure of the atmosphere, which pressing equally on all parts, will force the fluid from the source, through whatever channels it is to pass, till it meets with an equal resistance from the pressure of the atmosphere at the other end. This is the principle on which fountains and jets-d'eau are constructed. The water which is spouted out by the fountain is always conveyed in a pipe from some source, which lies higher than the mouth of the fountain.

When the pressure of the atmosphere is removed from the mouth of a pipe or tube, water will rise in it to the height of 30 feet above the height of its source. This is owing to the pressure of the atmosphere upon the source of the water; and on this principle the common pumps are constructed, a vacuum being created by the raising of the piston of the pump.

All bodies lighter than water swim in that element, bodies which are heavier are capable of displacing a bulk of water equal to their own, and consequently sink. Ice (which is water in a solid state) floats upon water, from its being porous. For the same reason water, in freezing, bursts glass vessels, &c. in which it is contained: as it is more porous than water, it necessarily takes up more room.

Water constitutes, if not the principal, at least, a considerable, part of the food of vegetables. It is the medium by which a certain class of animals, on this account termed aquatic, respire; its utility to man, as well in diluting his food, as in increasing his enjoyments in various modes, it would be tedious and useless minutely to describe. A quantity of air is generally contained in water.*

* As water is frequently mixed with foreign matter, and often the repository of minute animals, or vegetable seeds, we need not be surprised that, when carried to sea, it is always found to putrefy. But we must not

The other matters of which this universe, at least that part of it which is visible to us, is composed, may be reduced to three classes. 1st. Those which are purely combustible, such as all animal and vegetable matters: 2dly. Those which may be reduced to a calx or cinder, such as most of the metals: 3rdly. Those on which fire appears to have no effect, and produces no alteration of weight, such as the precious metals, gold for instance.

Another division has been adopted by chemists, who divide all uninflamable matters into the vitrifiable (or that which is convertible into glass) and the calcareous, or that which is convertible into lime.

Thus crystals, precious stones, free-stone, granites, porphyrics, agates, gypsums, lava, pumice stone, with all metals and other minerals, are vitrifiable either by the fire of our furnaces, or that of burning mirrors; whereas marble, alabaster, chalk, marl, and other substances which proceed from the waste shells and madrepores, cannot be reduced into fusion by these means. Nevertheless, I am persuaded, that if we attain the point of still increasing the power of our furnaces, and especially our burning mirrors, we shall obtain the point of fusing these calcareous matters, which appear to be of a different nature from the rest; since there are a multiplicity of reasons to think, that at the bottom their substance is the same, and that flint or glass is the common basis of all terrestrial matters.

suppose that it is the element itself, which thus grows putrid and offensive, but the substances with which it is impregnated. It is true, the utmost precautions are taken to destroy all vegetable and animal substances, that may have previously been lodged in it, by boiling: but, notwithstanding this, there are some that will still survive the operation; and others, that find their way during the time of its stowage. Seamen, therefore, assure us, that their water is generally found to putrefy twice, at least, and sometimes three times, in a long voyage. In about a month after it has been at sea, when the bung is taken out of the cask, it sends up a noisome and dangerous vapour, which would take fire upon the application of a candle. The whole body of the water then is found replete with little worm-like insects, that float, with great briskness, through all its parts. These generally live for about a couple of days; and then dying, by depositing their spoils, for a while increase the putrefaction. After a time, the heavier parts of these sinking to the bottom, the lighter float, in a scum, at the top; and this is what the mariners call, the water's purging itself. There are still, however, another race of insects, which are bred, very probably, from the spoils of the former, and produce, after some time, similar appearances; these dying, the water is then thought to change no more. However, it very often happens, especially in hot climates, that nothing can drive these nauseous insects from the ship's store of water. They often increase to a very disagreeable and frightful size so as to deter the mariner, though parching with thirst, from tasting the cup which they have contaminated.

In the great mass of solid matter, which earth represents to us, the superficial matter is the least pure earth. All matters deposited by the sea in form of sediment, all stones produced by shell animals, all substances composed by the combinations of the waste of the animal or vegetable kingdom; all those which have been changed by volcanean fires, or sublimed by the internal heat of the globe, are mixed and transformed substances; and although they compose very great masses, they do not clearly enough represent to us the element of EARTH. It has been just observed, that that earth which is called vitrifiable, or that of which flint and glass are formed, appears to be the original substance of all terrestrial bodies: and this supposition is the more probable, since all solid matter, ever so much decomposed, reduces ultimately into glass by the sole action of fire: it retakes its first nature when it is disengaged from fluid or volatile matter, which were united with it; and this glass, or vitreous matter, which composes the mass of our globe, so much better represents the element of earth, as it has neither colour, odour, taste, liquidity, nor fluidity, qualities which all proceed from the other elements, or belong to them.

Of all the substances which are found upon the earth, or within its bowels, those from which the METALS are formed are the most curious. It is almost unnecessary to state, that they exist in the mine in a form very different from that which they assume, when they have been melted in the furnace, and polished by the art of man. In their original state they are called ores, and the metal is then mixed with earthy particles and other matters which are expelled by fire. The most precious metals, as gold and silver, do not form the most splendid ores. The *pyrites*, which are a mixture of iron and sulphur, are much more beautiful to the eye.

The trade of a miner is the most wretched and most dangerous of all. They are not only exposed to the common accidents of the roof falling in or a sudden overflow of water, but also to a variety of *damps*,* as they are called, or noxious vapours, which are fatal to human life. Even the light and volatile parts of the minerals themselves, and especially arsenic, with which all mines abound, are im-

* Of these there are two principal kinds, the *fire damp* or *inflammable air*, which will take fire and explode like gunpowder with the smallest spark: the other is the *choak damp* or *fixed air*, which kills immediately when taken into the lungs with the breath. Ed.

bibed by the unfortunate workmen, and presently effect their destruction. On this account, coal-mines are generally less noxious than those of tin; tin than those of copper; but none are so dreadfully destructive as those of quicksilver. At the mines near the village of Idra, nothing can adequately describe the deplorable infirmities of such as fill the hospital there: emaciated and crippled, every limb contracted or convulsed, and some in a manner transpiring quicksilver at every pore. "There was one man, (says Dr. Pope,) who was not in the mines above half a year, and yet whose body was so impregnated with this mineral, that putting a piece of brass money in his mouth, or rubbing it between his fingers, it immediately became as white as if it had been washed over with quicksilver. In this manner all the workmen are killed, sooner or later; first becoming paralytic, and then dying consumptive: and all this they sustain for the trifling reward of seven-pence a day."

The surface of this globe is divided, from one pole to the other, by two immense bands of earth, and two of water. The first and principal of these portions of earth is that which is called the ancient continent, and which includes, Europe, Asia, and Africa. This continent, if measured from the two extreme corners, that is, from the most eastern part of Tartary to the Cape of Good Hope, will produce a line of 3600 leagues; and if measured according to the meridian, that is directly from north to south, we shall find that there are only 2500 leagues from the northern Cape of Lapland to the southernmost point of the Cape of Good Hope. The utmost breadth of this continent, that is, from the western coast of Africa, to Trefana, as far as Nisingpo, on the east coast of China, is about 2800 leagues. Another line may be drawn also from Brest in Brittany, as far as the coast of Chinese Tartary, to the extent of 2300 leagues. The old continent, on the best calculations, may be said to contain 4,940,780 square leagues, which is about a fifth part of the surface of the globe.

The new continent, so called because more recently discovered, goes under the general name of America, and is divided into north and south. Its greatest length may be estimated from the mouth of the river Plata in Paraguay to the lake of the Asseniboils, which amounts to about 2500 leagues. The new continent is supposed to contain

2,140,212 square leagues. The whole superficial contents, therefore, of both the old and new continents, are about 7,080,993 square leagues; not near a third of the surface of the globe, which contains 25,000,000 square leagues.

The ancients were acquainted with but a small part of the globe. All America, the Magellanic land, and a great part of the internal regions of Africa, were entirely unknown to them. They only knew that the torrid zone was inhabited, although they had navigated round Africa; for it is 2200 years since the new King of Egypt gave vessels to the Phenicians which departed from the Red Sea, coasted round Africa, doubled the Cape of Good Hope, and having employed two years in this voyage, the third year entered the straits of Gibraltar.* Nevertheless, the ancients were not acquainted with the property which the load-stone had, of turning towards the poles, although they knew that it attracted iron. They were ignorant of the general cause of the flux and reflux of the sea; they were not certain that the ocean surrounded the globe without interruption; some indeed suspected it, but with so little foundation, that no one dared to say, or even conjecture, that it was possible to make a voyage round the world. Magellan was the first who made it, A. D. 1519, in 1124 days. Sir Francis Drake was the second, in 1577, and he did it in 1056 days; Thomas Cavendish afterwards made this great voyage in 777 days, in the year 1586. These famous travellers were the first who demonstrated, physically, the globular form and the extent of the earth's circumference; for the ancients were far from having a just measure of this circumference, although they had travelled a great deal. The general and regulated winds, and the use to be made of them in long voyages, were also absolutely unknown to them; we must therefore not be surprized at the little progress they made in Geography, since at present, in spite of all the knowledge we have acquired by the aid of mathematical sciences, and the discovery of navigators, many things remain still to be found, and vast countries to be discovered.

As there is so large a portion of the globe with which we are unacquainted, particularly near the poles, where the ice has never permitted any navigator to penetrate, we cannot exactly know the proportion between the surface of the earth, and that of the sea; only as far as may be

* See Herod. Lib. iv.

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* See Herod. Lib. iv.

judged by inspection of what is known, there is more sea than land.

If we would have an idea of the enormous quantity of water which the sea contains, let us suppose one common and general depth of the ocean; by computing it only at 200 fathoms, or the 10th part of a mile, we shall see that there is sufficient water to cover the whole globe to the height of 600 feet of water, and if we would reduce this water into one mass, we shall find that it forms a globe of more than 60 miles diameter.

The FORM OF THE EARTH is not that of a perfect globe, but rather what is termed a spheriod, a globe which is flattish at the poles; the axis, therefore, or line which may be supposed to pass through it at the equator, is to its axis at the poles in the proportion of 230 or 229. The solid parts of the earth are formed of beds or strata* of different materials, which lie one upon another in a regular order. The first stratum or layer consists of mould, or common soil, mixed with a variety of decayed vegetable and animal matters, and with stony and sandy particles. In different parts of the world the other strata are found to consist of different materials, and differently disposed. In some parts the strata are horizontal, in others they are inclined; and veins or fissures of metals, coals and other minerals, frequently penetrate through the different beds of strata to a great depth, and divide them. At Marly-la-Ville in France, the following strata were found. It is a high country, but flat and fertile. The strata were here arranged horizontally. From the shells which were found in No. 16, we may conjecture, that at some period the soil of Marly-la-Ville was at the bottom of the sea, but has since been raised to the height of 75 feet.

The state of the different Beds of Earth found at Marly-la-Ville, at the depth of 100 feet.

Feet. Inch.

1. Reddish earth, mixed with much dirt, and a very small quantity of vitrifiable sand	-	-	-	-	13	0
2. Earth mixed with gravel, and vitrifiable sand	-	2	6			
3. Dirt mixed with much vitrifiable sand, which effervesced but little with aqua fortis	-	0	0			
	-	2	0			

* Layers, like the coats of an onion, or the leaves of a book.

Feet. Inch.

4. Hard marl, which made a very great effervescence with aqua fortis	- - - - -	2	0
5. Pretty hard marly stone	- - - - -	4	0
6. Marl in powder, mixed with vitrifiable sand	- - - - -	5	0
7. Very fine vitrifiable sand	- - - - -	1	6
8. Marl in earth, with a little vitrifiable sand	- - - - -	3	6
9. Hard marl, in which was real flint	- - - - -	3	6
10. Gravel, or powdered marl	- - - - -	1	0
11. Eglantine, a stone of the grain and hardness of marble, and sonorous	- - - - -	1	6
12. Marley gravel	- - - - -	1	6
13. Marble in hard stone, the grain very fine	- - - - -	1	6
14. Marl in stone, the grain not so fine	- - - - -	1	C
15. More grained and thicker marl	- - - - -	2	6
16. Very fine vitrifiable sand, mixed with sea fossil shells, which had no adherence with the sand, and whose colours were perfect	- - - - -	1	6
17. Very small gravel or fine marl powder	- - - - -	2	0
18. Marl in hard stone	- - - - -	3	6
19. Very large powdered marl	- - - - -	1	6
20. Hard and calcinable stone like marble	- - - - -	1	6
21. Grey and vitrifiable sand with fossil shells, particularly oysters and muscles, which had no adherence with sand, and were not petrified	- - - - -	3	0
22. White vitrifiable sand mixed with shells	- - - - -	2	0
23. Sand streaked red and white, vitrifiable and mixed with the like shells	- - - - -	1	0
24. Larger sand, but still vitrifiable, and mixed with the like shells	- - - - -	1	0
25. Grey fine and vitrifiable sand with similar shells	- - - - -	8	6
26. Very fine fat sand, with a few shells	- - - - -	3	0
27. Free-stone	- - - - -	3	0
28. Vitrifiable sand, streaked red and white	- - - - -	4	0
29. White vitrifiable sand	- - - - -	3	6
30. Reddish vitrifiable sand	- - - - -	15	0

Total depth when they left off digging 101 ft.

In a trench made at Amsterdam to make a pit, the earth was dry to the depth of 230 feet, and the strata of earth were found as follows: 7 feet of vegetable or garden earth, 9 feet turf, 9 feet soft clay, 8 feet sand, 4 feet earth, 10 feet sand, on which it is customary to fix the piles which support the houses of Amsterdam; then 2 feet agil or clay, 4 of white

sand, 5 of dry earth, 1 of soft earth, 14 of gravel, 8 argil, mixed with earth; 4 of gravel, mixed with shells; then clay 102 feet thick, and at last 31 feet sand, at which depth they ceased digging.

Every stratum, whether horizontal or inclined, has an equal thickness throughout its whole extent: that is, every bed of any matter whatever, taken separately, has an equal thickness throughout its whole extent; for example, when the bed of stone in a quarry is three feet thick in one part, it will have the same thickness throughout: if in one part it is found to be six feet thick, it will be so throughout. In the quarries about Paris the bed of good stone is not thick, scarcely more than 18 or 20 feet; in other quarries, as those of Burgundy, the stone is much thicker. It is the same with marble; the black and white marble have a thicker bed; the coloured are commonly thinner, and there are beds of very hard stone, which the farmers in Burgundy make use of to cover their houses, that are not above an inch thick. In general it may be said, that the thickness of the horizontal strata is so greatly varied, that it is found from one line and less to 1, 10, 20, 30, or 100 feet thick, the ancient and modern quarries which are horizontally dug; the perpendicular and other divisions of mountains, prove that there are extensive strata in all directions.

The different strata of which the earth is composed, are not disposed according to the order of their specific weight; for we often find strata of heavy matters placed on strata of lighter. To be assured of this, we have only to examine the nature of the earth on which rocks are placed, and we shall find that it is generally clay, which is specifically lighter than the matter of the rock. In hills and other small elevations, we easily discover the base on which rocks are placed; but it is not so with large mountains. Not only the summit is rock, but those rocks are placed on other rocks; there are mountains upon mountains and rocks upon rocks, to such a considerable height, and in so great an extent of ground, that we can scarcely be certain where there is earth at bottom, and of what nature it is. We see picked rocks which are many hundred feet high; these rocks rest on others, which perhaps are no less; nevertheless, may we not compare great with small? and since the rocks of little mountains, whose bases are to be seen, rest on earth less heavy and solid than stone, may we not suppose that the base of high mountains is also of earth?

In a soil where flint is generally the predominant stone, the country is usually fertile, and if the place is uncultivated, and these stones have been long exposed to the air, without being moved, the upper superficies is always very white, whereas the opposite side, which touches the earth, preserves its natural colour. If the blackest and hardest flint be exposed to the weather, in less than a year, its surface will change colour, and if we have patience to pursue this experiment, we shall see it by degrees lose its hardness, transparency, and other specific characters, and approach every day nearer and nearer the nature of argil.

What happens to flint, happens to sand; each grain of sand may be considered as a small flint, and each flint as a mass of grains of sand, extremely fine, and exactly grained. The example of the first degree of decomposition of sand is found in the brilliant and opaque powder called *Mica*, in which potters earth and slate are always diffused. The entirely transparent flints, the *Quartz*, produce, by decomposition, fat and soft talk, as petrifiable and ductile as clay: and it appears that talk is a mediate term between glass or transparent flint and argil, or clay; whereas coarse and impure flint, by decomposing, passes to potters earth without any intermedium.

Our artificial glass undergoes also the same alterations: it decomposes in the air, and perishes in some measure by remaining in the earth. At first its superficial scales exfoliate; by working it we perceive brilliant scales fly from it; but when its decomposition is more advanced, it crumbles between the fingers, and is reduced into a very white fine talky powder: and art has even imitated nature in the decomposition of glass and flint.

C H A P. II.

Of mountains—precipices—clefs, or caverns—rivers—the Nile—cataracts—subterraneous rivers—saltiness of the sea—of different seas—of lakes—their nature and properties.

WERE the earth an even and regular plain, instead of that beautiful variety of hills and valleys; of verdant forests, and refreshing streams, which at present delight our senses, a dismal sea would cover the whole face of

the globe, and at best it would only be the habitation of fishes.

It is not therefore to be supposed that even in its origin the surface of the earth was perfectly regular; and since its first production a variety of causes, the motion of the waters, the subterraneous fires, the wind, and other circumstances, have greatly contributed to the increase of this irregularity.

The greatest inequalities are the depths of the ocean, compared to the elevations of mountains; the depth is very different even at great distances from land; it is said there are parts above a mile deep, but these are few, and the most general profundities are from 60 to 150 fathoms. The gulphs bordering on the coasts are much less deep, and the straits have generally the least depth.

The highest MOUNTAINS in Asia are Mount Taurus, Mount Imaus, Caucasus, and the mountains of Japan; all these mountains are loftier than those of Europe: the highest mountains in Africa, i. e. the great Atlas, and the mountains of the moon,* are at least as high as those in Asia, but the highest of all are in South America, particularly the Andes in Peru, which are more than 3000 fathoms, that is upwards of three miles high; whereas the highest part of the Alps is not more than 1600 fathoms, or a mile and a half in height. In general the mountains between the tropics are loftier than those of the temperate zones, and these more than those of the frigid zones, so that the nearer we approach the equator, the greater are the inequalities of the earth: these inequalities, although very considerable with respect to us, are nothing when considered with respect to the terrestrial globe. Three thousand fathoms difference to 3000 leagues diameter, is one fathom to a league, or one foot to 2300 feet, which on a globe of $2\frac{1}{2}$ feet diameter, does not make the 6th part of a line, or the 90th part of an inch. Thus the earth, which appears to us crossed and cut by the enormous height of the mountains, and by the frightful depth of the sea, is nevertheless, relatively to its volume, only very slightly furrowed with irregularities, so very trifling, that they can cause no difference to the figure of the globe.

In continents the mountains are continued, and form chains. In islands they appear to be more interrupted and isolated, and generally raised above the sea, in form of a

* Famous for giving a source to the rivers Niger and Nile.

cone or pyramid, and are called *peaks*. The peak of Teneriffe is one of the highest mountains on the earth; it is near a mile and a half high perpendicular from the level of the sea: the peak of St. George in one of the Azores, and the peak of Adam in the island of Ceylon are also very lofty. All these peaks are composed of rocks, heaped one upon the other, and they vomit from their summits fire, cinders, bitumen, minerals, and stones. There are even islands which are precisely only as tops of mountains, as the island of St. Helena, Ascension, most of the Azores, and Canaries: and we must remark, that in most of the islands, promontories, and other projecting lands in the sea, the middle is always the highest, and they are generally separated by chains of mountains, which divide them in their greatest length, as the Grampian mountains in Scotland, which extend from east to west, and divide Great Britain into two parts; it is the same with the islands Sumatra, Lucon, Borneo, Celebes, Cuba, and St. Domingo, and also Italy, which is traversed through its whole length by the Appenine mountains, &c.

Precipices are formed by the sinking of rocks, the base of which sometimes gives way more on one side than the other, by the action of the air and frost, which splits and divides them; and by the impetuous fall of torrents, which opens passages, and carries along with them all that opposes their violence. But *ABYSSES*, that is, those vast and enormous cavities found at the summit of mountains, and to the bottom of which it is not possible sometimes to descend, although they were above a mile or half a mile round, have generally been formed by the operation of fire. These abysses were formerly the funnels of volcanos, and all the matter which is there deficient, has been ejected by the action and explosion of these fires, which are since extinguished through a defect of combustible matter. The abyss of mount Arrarat, of which M. Tournefort gives a description in his voyage to the Levant, is surrounded with black and burnt rocks, as one-day the abysses of Etna, Vesuvius, and other volcanos will be, when they have consumed all the combustible matters they include.

In Plots' Natural History of Staffordshire, a gulph is spoken of, which has been sounded to the depth of 2600 perpendicular feet, without meeting with any water; nay, the bottom was not found, as the rope was not long enough: this cavern is known by the name of Elden Hole. The opening at the top is not more than 40 yards wide.

Of this kind also, is that dreadful cavern described by *Ælian*.—"In the country of the Arian Indians," says that author, "is to be seen an amazing chasm, which is called, The Gulph of Pluto. The depth, and the recesses of this horrid place, are as extensive as they are unknown. Neither the natives, nor the curious who visit it, are able to tell how it first was made, or to what depths it descends. The Indians continually drive thither great multitudes of animals, more than three thousand at a time, of different kinds, sheep, horses, and goats; and, with an absurd superstition, force them into the cavity, whence they never return. Their several sounds, however, are heard as they descend; the bleating of sheep, the lowing of oxen, and the neighing of horses, issuing up the mouth of the cavern. Nor do these sounds cease, as the place is continually furnished with a fresh supply."

Great cavities and deep mines are generally in mountains, and they never descend to a level with the plains; therefore by these cavities, we are only acquainted with the inside of a mountain, and not at all with the internal part of the globe.

It was for a long time thought that the chains of the highest mountains run from east to west, till the contrary direction was discovered in the new world; but no person before Mr. Bourguet discovered the surprizing regularity of the structure of those great masses: he found, after having crossed the Alps, thirty times in fourteen different parts, twice the Appenine mountains, and made several tours in the environs of these mountains, and in mount Jura, that all mountains are formed nearly like the works of a fortification. When the body of the mountain runs from east to west, it forms prominences, which face as much as possible the north and south; this admirable regularity is so striking in vallies, that we seem to walk in a very regular covered way; if, for example, we travel in a valley from north to south, we perceive that the mountain which is on the right forms projections or angles which front the east, and those of the mountain on the left, front the west, so that, in fact, the salient angles of each side reciprocally answer the returning angles, which are always alternately opposed to them. The angles which mountains form in great vallies are less acute, because the direction is less steep, and as they are farther distant from each other; and in plains they are not so perceptible as in the course of rivers, which generally take up their elbows;

the middle of them naturally answer to the most striking projections, or the most advanced angles of mountains; and this is one cause of the serpentine course of rivers. It is astonishing so visible a thing has not been observed. When in a valley the inclination of one of the mountains which border it, is less steep than that of the other, the river takes its course much nearer the steepest mountain, and does not flow through the middle.

It may in general be said, that in Europe, Asia, and Africa, the RIVERS, and other mediterranean waters, extend more from the east to the west than from north to south, which proceeds from the chains of mountains being for the most part so directed; and that, in other respects, the whole continent of Europe and Asia is broader in this direction than the other; for there are two modes of conceiving this direction. In the long and narrow continent of South America, there is only one principal chain of mountains, that is, from east to west, or from west to east; in fact, it is in this direction all the rivers of America flow, because, excepting the Cordilleros, there are no very extensive chains of mountains, and none whose directions are parallel to them. In the old as well as the new Continent, most of the waters have their greatest extent from west to east, and most of the rivers flow in this direction, which is caused by another reason, i. e. that there are many long chains of mountains parallel to each other, whose direction is from east to west, and because the rivers and other streams are obliged to follow the intervals which divide these chains of mountains; consequently one single chain of mountains, directed from north to south, will produce rivers whose direction will be the same as that of those which issued from many chains of mountains, whose common direction is from east to west; and it is for this particular reason, that the rivers of America have this direction in common with those of Europe, Africa, and Asia.

A remarkable phenomenon has been observed with respect to rivers, and that is, that in the inland parts, and at a distance from the sea, they flow in a direct line, but in proportion as they approach their mouths, they assume more of a winding or serpentine course.* In large rivers

* The reason of this is probably that, as most rivers descend from mountains, and as their passage is less retarded by the continued rubbing against their beds, they are more rapid near the source. On the

there is a considerable eddy along the banks; and the nearer the sea the greater is this eddy. The surface of the water in rivers is by no means level from bank to bank; on the contrary, the middle of the stream is higher or lower than the water of the sides, according to circumstances. When a river swells suddenly by the melting of snow, or any other cause, the middle of the stream is sensibly higher than the sides: in one instance the elevation is said to have been as great as three feet. On the other hand, when rivers approach their mouths, the water near the sides is commonly more elevated than that in the middle.

The swelling of the Nile and its inundations has a long time employed the learned; most of them have looked upon it as marvellous, though one of the most natural things, and what is every year to be seen in every great river throughout the world. It is the rain which falls in Abyssinia and Ethiopia which causes the swelling and inundation of that river, though the north wind must be regarded as the primitive cause. 1st, Because it drives the clouds which convey this rain from the coast of Abyssinia; 2ndly, because blowing against the mouths of the Nile, it causes the waters to return against the stream, and thus prevents them from pouring into the sea in too great a quantity: this circumstance may be every year relied on, when the wind being at the north, and suddenly veering to the south, the Nile in one day loses what it gathered in four.

By a nice calculation it is supposed that the quantity of water which a river equally rapid with the Po, would convey to the ocean, would be in the proportion of a cubical mile in 26 days; and that all the rivers in the globe would, in the space of 112 years, supply the sea with 21,372,626 cubical miles of water, which is about equal to its whole contents.

From this calculation it follows, that the quantity of water evaporated from the sea, and which the clouds convey to the earth, producing rivulets, streams, and rivers, is from 20 to 21 inches a year, or about two-thirds of a line each day; and Mr. *Halley* has demonstrated that the vapours which rise from the sea,* and which the winds

contrary, when they descend into the plains, their course is known to be less rapid, and they are consequently diverted from a right line by every little obstacle which presents itself. The same reason will account for the different mouths of the Nile, the Ganges, &c. Ed.

* It is calculated that from a square foot of water, about one pint

convey over the earth, are sufficient to form all the rivers, and to supply all the water which falls on the surface of the earth.

When the course of a river is interrupted by a precipice, it frequently forms a cataract or waterfall. The fall of Niagara, in the river St. Laurence, in Canada, is the most famous in the world. The river is in the part just above the fall, three quarters of a mile broad—the whole of this vast sheet of water is poured down the rocks, from the height of 150 feet perpendicular. The noise of the fall is heard at several leagues distance; and the dashing produces a mist which reaches to the clouds, and which forms a most beautiful rainbow whenever the sun shines. Both the Rhine and the Nile have their cataracts. The river Volga, in Russia, has two. The river Zara, in Africa, has one near its source. The river Velino, in Italy, has a cataract of above an hundred and fifty feet perpendicular. Near the city of Gottenburgh, in Sweden, the river rushes down from a prodigious high precipice into a deep pit, with a terrible noise, and such dreadful force, that those trees designed for the masts of ships, which are floated down the river, are usually turned upside down in their fall, and often are shattered to pieces, by being dashed against the surface of the water in the pit; this occurs if the masts fall sideways upon the water: but if they fall endways, they dive so far under water, that they disappear for a quarter of an hour, or more: the pit into which they are thus plunged, has been often sounded with a line of some hundred fathoms long, but no ground has hitherto been found. There is also a cataract at Powerscourt, in Ireland, in which the water is said to fall three hundred feet perpendicular; which is a greater descent than that of any other cataract in any part of the world.

There are rivers which lose themselves in the sands, and others which seem to precipitate into the bowels of the earth: the Guadalquiver in Spain, the Tigris and the Rhine itself lose themselves in the earth. It is asserted, that in the west part of St. Domingo, there is a mountain of a considerable height, at the foot of which are many caverns or subterraneous rivers, and the rivulets fall with

is evaporated in 24 hours; of this water one part falls back into the sea, and another part is carried off in the form of clouds, these clouds are arrested by the tops of mountains, where they fall in the form of rain, &c.—This rain sinks into the earth, and forms springs, rivulets, &c, which uniting, fall from the mountains in larger currents. Ed.

so much noise as to be heard at the distance of seven or eight miles.

In the old continent there are about 430 rivers, which fall directly into the OCEAN, or into the Mediterranean and Black Sea, and in the new continent, scarcely 180 rivers are known, which fall directly into the sea: but in this number only the great rivers are comprehended. All these rivers carry to the sea a great quantity of mineral and saline parts, which they have washed from the different soils through which they have passed. The particles of salt, which are easily dissolved, are conveyed to the sea by the water. Some naturalists, and among the rest Halley, have pretended that the saltiness of the sea proceeded only from the salts of the earth, which the rivers transport thither. Others assert, that the saltiness of the sea is as ancient as the sea itself, and that this salt was created only that the sea might not corrupt: but it may be well supposed that the sea is preserved from corruption by the agitations of the wind, and the flux and reflux, as much as by the salt it contains; for when it is kept in a barrel, it corrupts in a few days, and Boyle relates that a mariner becalmed for 13 days, found at the end of that time the sea so infected, that if the calm had not ceased, the greatest part of his people on board would have perished. The water of the sea is also mixed with a bituminous oil, which gives it a disagreeable taste, and renders it very unhealthy. The quantity of salt contained in sea water, is about 1-40th part, and the sea is nearly equally saline throughout at the top as at the bottom, under the line, and at the Cape of Good Hope, although there are several parts, as on the Mosambique coast, where it is saltier than elsewhere. It is also asserted not to be so saline under the Arctic Zone, which may proceed from the great quantity of snow, and the great rivers which fall into those seas, and because the heat of the sun produces but little evaporation there, in comparison of the evaporation in hot climates.

The ocean surrounds the whole earth without any interruption of continuity, and the tour of the globe may be made by passing the point of South America; but it is not yet known whether the ocean surrounds the northern part of the globe in the same manner; and all mariners who have attempted to go from Europe to China by the north-east or north-west, have alike miscarried in their enterprises.

The seas which are called **MEDITERRANEAN**, are properly branches from the great ocean, by which they are supplied. **LAKES** differ from the Mediterranean seas, because they do not receive any water from the ocean; for, on the contrary, if they have communication with the seas, they furnish them with water; thus the Black Sea, which some geographers have regarded as a connection with the Mediterranean, and consequently as an appendix to the ocean, is in reality only a lake; because, instead of receiving water from the Mediterranean, it supplies it with some, and flows with rapidity through the Bosphorus into the lake called the sea of Marmora, and thence through the strait of the Dardanelles into the Grecian sea. The water of the Black Sea appears to be less clear, and much less saline than that of the ocean. No island is to be met with throughout this sea: tempests are very violent here, and more dangerous than in the ocean; because the whole body of the waters being contained in a bason, which may be said to have no outlet, they have a kind of whirling motion, when they are agitated, which strikes the vessels on every side with an insupportable violence.

Next to the Black Sea, the greatest lake in the universe is the Caspian sea, whose extent in length from north to south is about three hundred leagues, and scarcely more than fifty broad, on an average. This lake receives one of the greatest rivers in the world, i. e. the Volga; also some other considerable rivers, as the Keir, the Fay, and the Gempo; but what is singular is, that it does not receive any on its eastern side throughout this whole length of 300 leagues. There are some small islands in the Caspian sea, and its waters are much less saline than those of the ocean; storms are here very dangerous, and large vessels are not used for navigation therein, as it is shallow, and many banks and shoals are scattered under the surface of the water.

There are lakes which, like pools, do not receive any river, and from which none go out. There are others which do receive rivers, and from which others run; and lastly, some which only receive rivers. The Caspian sea and the lake Aral are of the last kind; they receive the waters of many rivers, and contain them. Thus the Dead sea receives the Jordan, though no river goes from it. In Asia Minor there is a small lake of the same kind, which receives the waters of a river the source of which is near Congi, and which, like the preceding, has no other

mode than evaporation, to throw off the waters it receives : there is one much larger in Persia, on which the town of Marago stands ; its figure is oval, and it is about ten or twelve leagues long, by six or seven broad : it receives the river Tauris, which is not very considerable. There is also a similar small lake in Greece, about 12 or 15 leagues from Lepanto, and there are some of the same kind both in Africa and America.

The most general and largest lakes, however, are those which having received another river, or many small rivers, give rise to other great rivers. It is worthy of remark that all lakes from which rivers derive their origin ; all those which fall into the course of rivers, and which carry their water thereto, are not saline ; and almost all those, on the contrary, which receive rivers, without other rivers issuing from them, are saline : which seems to favour the opinion we have laid down on the subject of the saltiness of the sea ; for evaporation cannot carry off fixed salts, and consequently those which rivers carry into the sea, remain in it ; and although river water appears to taste sweet, we well know that it contains a small quantity of salt, and in course of time the sea must have acquired a considerable degree of saltness, which must still continue increasing. It is thus therefore, in all probability, that the Black Sea, the Caspian sea, the lake Aral, the Dead sea, &c. are become salt.

The most remarkable lake perhaps in the world, is the Dead sea, the waters of which contain much more bitumen* than salt ; this bitumen, which is called the *Bitumen of India*, is no other than the Asphaltum, which has caused some authors to call this sea, *Lake Asphaltum*. The land which borders on this lake contains a great quantity of bitumen, and many have applied the fables to this lake, which the poets feign of the lake Avernus, that no fish could live in it, and that birds which attempted to fly over it were suffocated : but neither of these lakes produce such mortal events ; fish live in both, birds pass over them, and men bathe in them without the least danger. A petrifying lake in Ireland is also mentioned as remarkable ; and the lake Neagh, in Ireland, has also the same property of apparently turning wood, &c. into stone ; but these petrifications are no other than incrustations like those made by the water of Arcueil.

* Mineral pitch. Ed.

C H A P. III.

*Of winds, regular and irregular—monsoons—hurricanes—
whirlwinds—water spouts.*

NOTHING is more irregular in our climates than the course of the WINDS; but there are countries where this irregularity does not exist, but where the wind blows constantly in one uniform direction.

There are several causes which influence the motions of the air, but the most powerful is the heat of the sun, which, by rarefying the air, produces an influx of the cold air, which is a heavier fluid, and consequently presses in upon that which is rarefied and light, and produces a stream or current of air. In the torrid zone this effect is more uniformly manifest than in other parts of the world. In the regions near the equinoctial line, a continual rarefaction is produced by the sun, and a constant current of air follows that luminary in his progress from east to west. This easterly wind blows so generally in the Pacific Ocean, that the ships which sail from Acapulca to the Philippines, perform a voyage of 2700 leagues in less than two months.

About 28 or 30 degrees on this side of the line, the west winds are equally constant, and for this reason, the vessels returning from the West Indies to Europe, do not pursue the same route as in going out.

The winds which blow continually for some months, are generally followed by contrary winds, and mariners are obliged to wait for that which is favourable to them: when these winds change, a calm or dangerous tempest ensues for several days, and sometimes a month.

These general winds, caused by the rarefaction of the atmosphere, combine differently by different causes in different climates. In part of the Atlantic sea, under the temperate zone, the north wind blows almost constantly during the months of October, November, December, and January, which is the reason why these months are the most favourable to embark from Europe for India, in order to pass the line, by the favour of these winds; and it is known by experience, that ships which quit Europe in the month of March do not arrive sooner at Brazil than those

which sail in the month of October. The north wind almost continually reigns during winter in Nova Zembla, and the other northern coasts: the south wind blows during the month of July to Cape Verd, when the rainy season, or winter of these climates sets in: at the Cape of Good Hope the north west wind blows during the month of September: at Patna, in India, this north west wind blows during the months of November, December, and January, and produces heavy rains; but the east wind blows during the other nine months.

In the kingdom of Guzarat, and on the coasts of the neighbouring sea, the north winds blow from the month of March till the month of September; and during the other months of the year south winds almost always reign. The Dutch, to return from Java, generally set sail in the month of January or February by an easterly wind, which is felt as far as 18 degrees northern latitude, after which they meet with the south winds which carry them to St. Helena.

In the Mediterranean, the winds blow from the land towards the sea at the sun's setting, and, on the contrary, from the sea towards the land at its rising; so that in the morning it is an easterly wind, and in the evening a westerly wind. The south wind, which is rainy, and which generally blows at Paris, Burgundy and Champagne at the beginning of November, and which cedes to mild and temperate breezes, produces the fair weather vulgarly called the summer of St. Martin's.

On the sea, the winds are more regular than at land, because the temperature of the sea is more equal than that of the land, as the temperature of the latter is altered by a variety of causes; such as electricity, volcanoes, exhalations from the earth, the explosion of meteors, &c.

In general, on the sea, the east wind and those which come from the poles, are stronger than the west and those which proceed from the equators. On the land, on the contrary, the west and south winds are more or less violent than the east and north winds, according to the situation of the climates.

Contrary currents are often observed in the air. Clouds are seen to move in one direction, and others, which are higher or lower than the first, in a contrary course; but this contrariety of motion does not remain very long, and is commonly produced only by the resistance of some clouds to the action of the wind, and by the re-action of the di-

rect wind, which reigns solely as soon as the obstacle is dissipated.

The winds are more violent in mountainous places than in plains; and the higher we ascend, the more the power of the wind increases, until we reach the common height of the clouds; that is, to about one quarter, or one third of a league perpendicular: beyond that height, the sky is generally serene, especially in summer, and the wind is said to be even imperceptible on the tops of high mountains.

A current of air, like a current of water, increases in velocity, where the space of its passage is straitened; the wind which is scarcely perceptible in a wide and open plain, becomes violent in passing through a narrow passage between two mountains, or simply between two lofty buildings: and the point of the most violent action of the wind is above these structures or mountain straits. The air being compressed by the resistance of these obstacles, has a greater mass or density, and the same velocity subsisting, the effort or gust of wind becomes much stronger; this is the cause that near a church, or a castle, the winds seem to be much stronger than they are at a certain distance from these edifices. It has been often remarked, that the wind being reflected by an isolated building, does not prevent it from being more violent than a direct wind, which produced this reflected wind; for this we are able to discern no other reason than the above; the impelled air compresses against the building, and is reflected, not only with its former velocity, but also with a greater body, which, in fact, renders its action much more violent.

Particular winds, whether direct or reflected, are more violent than those which are general. An uniformly continued stream of air produces not such havock as the fury of those winds which blow in sudden gusts. The predominancy of certain winds, in certain parts, has occasioned a general division of them into zones, though it is not to be understood that their effects are invariable. The east wind, which extends 20 or 30 degrees on each side the equator, may be said to occupy the torrid zone. The north wind occupies the frigid zone; and with respect to the temperate zone, the winds which reign there, are, if the expression may be allowed, only currents of air, whose motion is composed of those two winds whose direction tends to the west; and with respect to the westerly winds, whose direction tends to the east, and which often

reign in the temperate zone, whether in the Pacific or Atlantic oceans, they may be considered as winds reflected by the continents of Asia and America, but originally derived from the east and north winds.

The **MONSOONS**, or **TRADE WINDS**, are subject to deviations. Some continue for a longer, some for a shorter time; and they also differ in their extent, and in their degree of violence. In the Indian ocean, for instance, between Africa and India, as far as the Moluccas, the east winds begin to reign at the month of January, and last till the beginning of June. In the month of August or September, the contrary motion begins; and the west winds reign during three or four months. In the intervals of these monsoons, that is, at the end of June, in the month of July, and beginning of August, there is no wind on that sea; but they have violent storms, which come from the north.

There are winds which may be regarded as particular to certain coasts; for example, the south wind is almost continual on the coasts of Chili and Peru; it begins at the 46th degree, or thereabouts, south latitude, and extends beyond Panama, which renders the voyage from Lima to Panama much easier to be performed than the return. The western winds blow almost continually, or at least very frequently, on the Megellanic coasts, and over the environs of the strait of Le Maire; the north and north-west winds almost continually reign on the Malabar coast; the north-west wind is also very frequent on the coast of Guinea; and at a certain distance from that coast, in the open sea, we meet with the north-east wind very frequently. The westerly winds reign on the coasts of Japan, in the months of November and December.

The alternate or periodical winds, which we have just been speaking of, are sea winds; but there are also land winds, which are periodical, and return either at a certain season, or in certain days, or even at certain hours: on the Malabar coast, for example, from the month of September to April, a land wind blows from the eastern side; this wind generally commences at midnight and finishes at noon, and is not felt beyond 12 or 15 leagues from the coast, and from noon till midnight a weak sea wind reigns, which comes from the west; on the coast of New Spain in America, and on that of Congo in Africa, land winds reign during the night, and sea winds during the day: at Jamaica

the winds blow from all quarters at once during the night, and vessels cannot then come in, nor depart from it with safety in the day time.

The winds are however more irregular on the land than on the sea, and more irregular on the higher lands than on plains. The mountains not only alter the direction of winds, but even they produce winds, which are either constant or variable according to different causes; the melting of the snow, which is upon the mountains, generally produces constant winds, which sometimes remain very long; the vapours which are stopt by mountains which accumulate there, produce variable winds, very frequent in all climates. In the straits, on all the projecting coasts, at the extremity and in the environs of all promontories, peninsulas and capes, and in all narrow gulphs, storms are frequent: but there are also seas much more tempestuous than others. The Indian ocean, the Japan sea, the Megellanic sea, that of the African coast beyond the Canaries, and on the other side towards the country of Natolia, the Red sea, &c. are very liable to storms. The Atlantic ocean is more stormy than the ocean, which is called from its tranquillity, the *Pacific Sea*; nevertheless this Pacific sea is not absolutely tranquil, except between the tropics, and about the temperate zones; and the more we approach the poles, the more we are subject to variable winds, whose sudden change often causes tempests.

All terrestrial continents are subject to variable winds, which often produce singular effects: in the kingdom of Cassimir, which is surrounded by the mountains of Caucasus, a very sudden reverse of seasons is felt. In less than an hour's journey on mount Pirepenjale we pass from summer to winter. A north and a south wind blow preceptibly within 200 paces of one another on the mountains of Gatela of India; the extreme heats of summer are felt on one side of the mountain, and all the rigours of winter on the other. The same phenomenon is also observed at Cape Rozalgate in Arabia, and on the Island of Ceylon.

In Egypt during summer, hot south winds very commonly prevail, which disturb the respiration, and raise so great a quantity of sand, that the sky seems covered with thick clouds; this sand is so fine, and driven with such force, that it penetrates every where, even into the closest coffers. When these winds last many days they cause epidemical diseases, which are often followed by a great mortality.

The Cape of Good Hope is famous for its tempests, and the singular cloud which produces them : this cloud appears at first only like a small round spot in the sky, called by the sailors *the Ox's Eye*, and which probably appears so minute from its exceeding great height. In Natolia a small cloud forms like the Ox's eye at the Cape of Good Hope, and from this cloud issues a terrible wind, which produces similar effects.* In the sea between Africa and America, especially under the equator and in the neighbouring parts of it, these kind of tempests very often arise : near the coast of Guinea sometimes three or four of these storms are formed in a day ; they are caused and annouced, like those of the Cape, by small black clouds : the rest of the sky is generally very serene, and the sea calm. The first blast which proceeds from these clouds is furious, and would sink ships in open sea, if they did not take the precaution to furl the sails : it is principally in the months of April, May and June that these tempests are experienced on the Guinea sea, because no regular wind blows there during the season.

All these tempests are produced by winds which proceed from a cloud, and their direction, is either to the north or south, north east or south west, &c. but there are others called HURRICANES, which are still more violent than these, and in which the winds seem to proceed from all the coasts ; they have a whirling motion which nothing can resist. A calm generally precedes these horrible tempests, and the sea then appears like a piece of glass : but in an instant the fury of the winds raises waves as high as the clouds. There are parts where we cannot land, because alternately there are always calms and hurricanes of this kind : the Spaniards have therefore called these places *calms and tornados*.

When from a sudden rarefaction, or any other cause, contrary currents of air meet in the same spot, a WHIRLWIND is produced. Perhaps the same effect takes place in another element, and gulphs or whirlpools may be no other than the eddies of the water formed by the action of two or more opposite currents : the Euripus, so famous for the

* The cause of the wind which succeeds the appearance of the cloud, seems to be the rarefaction of the air caused by the discharge of electrical matter from the cloud. In the hot climates these black clouds are known to be highly charged with electricity, and the electric fire being in this respect analogous to other fire or heat, produces an immediate rarefaction of the air. This rarefaction produces a kind of vacuum, and the cold dense air rushing in, a tempest naturally ensues. Editor.

death of Aristotle, alternately absorbs and rejects the water seven times in twenty-four hours; this gulph is near the Grecian coast. The Charybdis, which is near the strait of Sicily, rejects and absorbs the water thrice in twenty-four hours: on the whole, we are not quite certain of the number of alternatives of motions in these gulphs. The greatest known gulph is that of the Norway sea, which is affirmed to be upwards of twenty leagues in circuit. It absorbs for six hours all that is near it, water, ships, &c. and afterwards returns them in the same space of time as it drew them in.

A WATERSPOUT is no other than a whirlwind at sea. The vacuum which is caused by the meeting currents causes the water to rise up in the form of a cylinder, or rather of an inverted cone. In the travels of M. Thevenot there is a very minute and circumstantial account of the formation of a waterspout, though there is reason to suspect that the relation is not without some optical deceptions.

“ The first, says this celebrated voyager, which appeared to me was on the northern coast, between us and the island Quesomo, at a gun-shot from the ship, the head of the ship was then to the north east: we directly perceived water which boiled on the surface of the sea about a foot high; it was whitish, and appeared above that height like a thick smoke, so that it properly resembled some burning straw, which only smoked; it made a noise like that of a torrent which runs with much rapidity in a deep valley: but this noise was mixed with a clearer, similiar to the strong hissing of serpents or vipers; a little while afterwards we perceived something like a dark canal, which bore a strong resemblance to a smoke which ascends towards the clouds, turning round with great velocity; this appeared about the thickness of my finger, and the same noise still continued; the duration of this spout was no longer than about half a quarter of an hour: this over, we perceived another on the south side of us, which began in the same manner as the preceding: and almost as soon, a similiar one made its appearance on the west side; and directly after a third by the side of this second, the farthest of the three might be about a musket shot distance from us: they all three appeared like burning heaps of straw, a foot and a half or two feet high. We afterwards saw as many canals which descended from the clouds, on those places where the water was raised up, and each of them

was as broad at the end fastened to the cloud, as the broad end of a trumpet, and resembled the breast or that of an animal, drawn perpendicularly down by a heavy weight; these canals appeared of a darkish white, and were not straight, but crooked in some places, they even were not perpendicular; but on the contrary, from the clouds where they were joined to the parts which drew in the water, they were very much bent; and what is more particular, is that the cloud which the second of these three was fastened to, having been driven by the wind, this canal followed it without breaking or quitting the place where it drew in the water, and passing behind the first canal, they were sometimes crossed like a St. Andrew's Cross. At the beginning they were all three about the thickness of my finger, but afterwards the first of the three increased considerably: but the last which was formed scarcely remained longer than that which we saw on the north side. The second on the south side remained about a quarter of an hour, but the first on that side remained a little longer, and this it was which terrified us the most. At first its canal was as thick as my finger, afterwards as thick as my arm, then as my leg, and at last as the trunk of a large tree, which a man might compass with his arms. We distinctly perceived water through this transparent body, which ascended in a serpentine manner. Sometimes it diminished a little in size, sometimes at top and sometimes at bottom, then it resembled exactly a soft tube with some fluid matter pressed with the fingers, either upwards to make this liquor descend, or at bottom, to cause it to ascend. After this it diminished so much that it was thinner than my arm; afterwards it returned as thick as my thigh, and then again became very thin; at last, I saw that the water elevated on the surface of the sea began to lower, and the end of the canal which touched it divided and grew narrower, when a variation of the light removed it from our view."

CHAP. IV.

Of volcanoes—earthquakes—the formation of new islands—caves and grottoes—bogs and fens—mutations of land into sea, &c.

THE burning mountains called VOLCANOES, include in their bowels sulphur, bitumen, and matters which serve as aliment to a subterraneous fire, the effect of which is more violent than that of gunpowder, or even of thunder. A volcano is a cannon of an immense volume, the orifice of which is often more than half a league: this mouth vomits forth torrents of smoke, flame, rivers of bitumen, sulphur, and melted metal, clouds of cinders and stones, and sometimes it ejects enormous rocks to many leagues distance, which human powers united could not move: the combustion is so terrible, and the quantity of burnt and melted matters which the mountain throws out, is so plentiful, that they enter cities, forests, cover the fields an hundred and two hundred feet in thickness, and form sometimes hills and mountains, which are only heaps of these ejected matters. The action of this fire is so great, the force of explosion so violent, that its reaction has been known to shake and move the earth, agitate the sea, overthrow mountains, and destroy the most solid towns and edifices, even to very considerable distances. The natives of Iceland imagine that the roarings of the volcano are the cries of the damned, and its eruptions the effects of the rage and despair of these unhappy wretches.

In Europe are three famous volcanoes, mount Etna, in Sicily, mount Hecla in Iceland, and mount Vesuvius in Italy, near Naples. Mount Etna has burnt from time immemorial; its eruptions are very violent, and the matters it throws out are so plentiful, that they may be dug to the depth of 68 feet, where we meet with marble pavement, and the vestiges of an ancient town which has been covered and buried under this thickness of matter thrown out from the mountains, in the same manner as the city of Herculaneum has been covered by the matter thrown out from Vesuvius. New mouths of fire were formed in 1650, 1669, and at other times: we see the flame and smoke of this volcano from Malta, which is about 60 leagues distance

from it. In 1537, there was an eruption of this volcano, which caused an earthquake in Sicily for 12 days, and which overthrew a very great number of houses and structures: it ceased only by the opening of a new mouth, which burnt every thing for five miles in the environs of the mountain. The cinders thrown out by the volcano were so abundant, and ejected with so much force, that they were driven as far as Italy; and vessels which were departed to some distance from Sicily, were incommoded by them. Farelli describes the conflagration of this mountain circumstantially, and says the foot of it is 100 leagues in circumference.

This volcano has now two principal mouths, the one narrower than the other; these two vents always smoke, but fire is never seen to issue from them, except during the time of eruptions: it is pretended that stones are found which the volcano has thrown out to the distance of 60,000 feet.*

One of the last and most violent eruptions of mount Vesuvius was in the year 1737. The mountain vomited by several mouths large torrents of burning metallic matters, which dispersed themselves over the country and into the sea. Mons. Montesquieu, who communicated this relation to the Academy of Sciences, observed with horror one of these rivers of fire, and saw its course for six or seven miles till it reached the sea; its breadth was sixty or seventy feet, its depth twenty-five or thirty palms, and in certain bottoms or valleys, 220: the matter which flowed was like the scum which issues from the furnace of a forge.

In Asia as well as in America there are a great number of volcanos; but there is nothing peculiarly worthy of remark in any, except the violence with which some of them occasionally emit the burning matters with which they are charged.

In Africa there is a mountain, or rather a cavern, called *Beniguazewel*, near Fez, which always emits smoke, and sometimes flames. One of the islands of Cape Verd, called the island of *Fuogo*, is only a large mountain which continually burns; this volcano, like the rest, throws out many cinders and stones; and the Portuguese who have

* See a most interesting description of this celebrated mountain in an elegant and entertaining production, published by Mr. Kearsley, intitled "The Present State of Sicily and Malta."

attempted several times to erect habitations in this island, have been constrained to abandon this project, through the dread of the effects of the volcano. The Canaries, the Peak of Teneriffe, and some of the highest mountains of the earth, of the Andes in particular, throw out fire, cinders, and large stones; from the top, rivulets of melted sulphur flow, which are distinguishable at a great distance.

The matters which volcanoes throw out, generally come forth in the form of a torrent of melted minerals, which inundates all the environs of these mountains; these rivers of flaming melted matters extend even to considerable distances, and by cooling, form horizontal or inclined strata, which for position are like the strata formed by the sediment left by the waters; but it is very easy to distinguish the strata produced from matters thrown out by volcanoes, from those which have the sediment of the sea for their origin. 1. Because these strata are not throughout of an equal thickness: 2. Because they contain only matters which are evidently perceived to have been calcined, vitrified, or melted, and because they do not extend to any great distance. When coal mines are opened, which are generally met with in argillaceous earth, (clay,) at a great depth, it sometimes happens that these matters have taken fire; there are even mines of coal in Scotland, Flanders, &c. which have burnt for a number of years. The communication of the air suffices to produce this effect, but those fires which are lighted in these mines, produce only slight explosions, and do not form volcanoes,* because all being solid and full in these places, fire cannot be excited, like that of volcanoes, in which there are cavities and void places where the air penetrates, which must necessarily extend the conflagration and augment the action of the fire, to the point in which we see it when it produces the terrible effects we have spoken of.

* The inflammable air is detached or exhaled in amazing quantities in certain places. There was formerly a burning-well near Wigan, in Lancashire; and another at Brosely, which is now stopped up: the vapour of which, when a candle was brought within about a foot of the surface of the water, caught flame like spirits of wine, and continued blazing for several hours after. Of this kind, also, are the perpetual fires in the kingdom of Persia. In that province, where the worshippers of fire hold their chief mysteries, the whole surface of the earth, for some extent, seems impregnated with inflammable vapours. A reed stuck in the ground continues to burn like a flambeau; an hole made beneath the surface of the earth, instantly becomes a furnace answering all the purposes of a culinary fire, Editor.

There are two kinds of EARTHQUAKES, the one caused by the action of subterraneous fires, and the explosion of volcanoes, which are only felt at small distances, and at the times when volcanoes act, or before they open; when the matters which form subterraneous fires, ferment, heat and inflame, the fire makes an effort on every side, and if it does not find a natural vent, it raises the earth and forms a passage by throwing it out, which produces a volcano, whose effects are repeated, and last in proportion to the quantity of inflammable matters. If the quantity of matters which take fire, is not considerable, a commotion or an earthquake may ensue, without a volcano being formed. The air produced and rarefied by the subterraneous fire, may also find small vents, by which it will escape, and in this case there will be only a shock without any eruption or volcano - but when the inflamed matter is in a great quantity, and confined by solid and compressed matters, then a commotion and volcano arises; but all these commotions form only the first kind of earthquakes, and can only shake a small space of ground. A very violent eruption of Mount Etna, will cause, for example, an earthquake throughout the whole island of Sicily; but it will never extend to the distance of three or four hundred leagues. When any new mouths are formed in Mount Vesuvius, there are earthquakes at Naples and in the neighbourhood of the Volcano: but these earthquakes have never shook the Alps, and are not communicated to France or to other countries remote from the source of the phenomenon.

But there is another kind of earthquake, very different in its effects, and perhaps for its causes; there are earthquakes which are felt at great distances, and which shake a long course of ground, without any new volcano or eruption appearing.

To understand rightly what may be the causes of this kind of earthquake, it must be remembered, that all inflammable matters capable of explosion, produce, like gunpowder, by inflammation, a great quantity of air and vapour; that this air produced by fire is in a state of very great rarefaction. Let us therefore, suppose, that at a very considerable depth, as at or about one or two hundred fathoms, pyrites, and other sulphureous matters are to be met with; and that, by the fermentation produced by the filtration of the water, or other causes, they inflame; and let us see what must happen: at first, these matters are not disposed regularly by horizontal strata, as the more ancient

matters are, which have been formed by the sediment of the waters; on the contrary, they are formed in perpendicular strata, in caverns at the foot of these clefts, and in other parts where the water can act and penetrate. These matters inflaming, will produce a great quantity of air or vapour, the spring of which compressed in a small space, like that of a cavern, will not shake the earth immediately above, but will search for passages in order to make its escape; it will, therefore, naturally force its way through those parts where it meets least obstruction, and will, therefore, proceed through the interstices between the different strata, or through any channel or caverns which may afford it a passage. This subterraneous air or vapour will therefore produce in its passage a noise and motion proportioned to its force, and to the resistance it meets with; and these effects will continue till it finds a vent, perhaps in the sea, or till it has diminished its force by being greatly expanded. This explanation corresponds entirely with all the phenomena which are observed respecting earthquakes. They proceed with a wave-like motion, and are felt at different places not at the same instant, but at different times, in proportion to the distance.

We can only confirm what has been advanced, by connecting it with two other circumstances. It is well known that mines exhale vapours, independent of the wind produced by the current of the water; we often see currents of unhealthy air and suffocating vapours; it is also known that there are holes, abysses and deep lakes in the earth, which produce winds, like the lake Boleslaw, in Bohemia, &c.

From history we have innumerable instances of the dreadful and various effects of these terrible phenomena. Pliny, in his first book, chap. 81, relates, that in the reign of Tiberius, an earthquake happened, which overthrew twelve cities in Asia; and in his second book he says, that by a great earthquake there were 100 towns overthrown in Lybia. In the time of Trajan, the town of Antiochus, and a great part of the adjacent country, were swallowed up by an earthquake; and in the time of Justinian, in 528, this town was a second time destroyed by a similar cause, with upwards of 40,000 of its inhabitants: and, sixty years after, in the time of Saint Gregory, it felt the effects of a third earthquake, with the loss of 60,000 persons. In the time of Saladin, in 1182, most of the towns of Syria and Jerusalem were destroyed by the same cause.

In Calabria and Poh, there have been more earthquakes than in any other part of Europe. In the time of Pope Pius XI. all the churches and palaces of Naples were overthrown, and above 30,000 of its inhabitants killed; and all those which remained alive, were obliged to live in tents, till they had rebuilt their houses. In 1629, there were earthquakes in Pola, which destroyed 7000 persons; and in 1638, the town of St. Euphemia was swallowed up; and there remains only a stinking lake in its place. Ragusa and Smyrna were also almost destroyed. There was an earthquake in 1692, which extended into England, Holland, Flanders, Germany, and France; it was chiefly felt on the sea coasts and rivers, and extended to a space of at least 2600 leagues square. On the 16th of June, 1628, there was so terrible an earthquake in the island of St. Michael, that the sea near it opened, and, in one place, where it was more than 150 fathoms deep, threw up an island more than a league and a half long, and upwards of 60 fathoms high.

Another earthquake happened in 1691, which began the 16th of July, and lasted in the island of St. Michael till the 12th of the following month. Tercera and Fayal were agitated the next morning with so much violence, that they appeared to move: but these frightful shocks returned only four times; whereas, at St. Michael's, they did not cease a moment for 15 hours. The islanders having quitted their houses, which they saw fall before their eyes, passed all that time exposed to the injuries of the weather. A whole town, named Villa Franca, was overthrown to its very foundation, and most of the inhabitants buried under its ruins. In many parts the plains rose into hills; and in others, some mountains flattened or changed situation. A spring of water issued from the earth, which flowed for four hours, and which appeared dry all on a sudden. The air and sea, still more agitated, resounded with a noise which might have been taken for the roaring of a number of wild beasts. Many persons died with the fright, the ships in the ports suffered dangerous shocks, and those which were at anchor, or under sail, at 20 leagues distance from the islands, suffered considerable damage.

In the year 1646, the mountain of the island of Machian split with terrible reports, by an earthquake, an accident which is very common in that country: so many fires issued through this opening, that they consumed many negro-yards, with the inhabitants, and all that was in them. In

the year 1685, this prodigious crack was to be seen, and still is apparent; it is called the path of Machian, because it descends from the bottom like a road hollowed out, but which, at a distance, appears like a path.

There are earthquakes which are felt for some distance at sea. M. Shaw relates, that, in 1721, being on board the *Gazelle*, an Algerine vessel, mounting 50 guns, three violent shocks were felt one after the other, as if every time a weight of 20 or 30 tons had been thrown on the ship. This happened in a part of the Mediterranean which was 200 fathoms deep.

In countries subject to earthquakes, it happens, when a new volcano is formed, earthquakes cease, and are only felt in the violent eruptions of the volcano, as is observed in the island of St. Christopher.

NEW ISLANDS are produced, either suddenly, by the operation of subterraneous fires, or slowly, by the accumulated sediments of water. Seneca informs us, that, in his time, the island Therasia suddenly emerged from the sea; and Pliny relates, that thirteen islands arose all at once from the bottom of the Mediterranean. Upon this subject, however, we have some facts more recent, and less involved in obscurity.

The 23rd of May, 1707, at the sun's rising, near this same island of Therasia, or Santorin, something was seen like a floating rock in the sea; some persons who were curious, went near it, and found this shoal, which had issued from the bottom of the sea, to increase under their feet; and they brought with them the pumice stone and oysters, which the rock still had attached to its surface. There was a slight earthquake at Santorin, two days before the growth of this shoal. This new island increased considerably till the 14th of June, without any accident, and was then half a mile round, and from twenty to thirty feet high; the earth was white, and bordered a little on argillaceous; but after that, the sea was troubled more and more: vapours arose, which infected the island Santorin; and the 16th, 17th, or 18th of July, several rocks were seen to issue at once from the bottom of the sea; all of which united and formed like one rock. All this was done with a dismal noise, which continued upwards of two months, with flames which rose from the new island; it still kept increasing in circumference and height; and the explosions always threw out rocks and stones more than seven miles distance.

The 10th of October 1720, near the island of Tercera, a very considerable fire arose out of the sea. Some mariners having approached it by orders of the governor, perceived, the 19th of the same month, an island which appeared to be covered with fire and smoke, and a prodigious quantity of cinders thrown to a distance, as from a volcano, and accompanied with a noise similar to that of thunder.

On the whole, however, the islands produced by the action of fire and earthquakes, are but few, and these events are seldom; but there are an infinite number of new islands produced by the mud, sand and earth, which the rivers, or the sea carry and transport into different places. At the mouth of all rivers, masses of earth and banks of sand are formed, whose extent often becomes considerable enough to form islands of a moderate size. The sea retiring from certain coasts, leaves the most elevated parts naked, which form so many new islands; and so, likewise, by extending itself on certain shores, it covers the lowest parts, and leaves the highest, which it could not surmount, apparent above the surface of the water, which form so many more islands: in consequence of which, it is remarked, that there are very few islands in the middle of the sea, and that they are almost all in the neighbourhood of the continents, where the sea formed them, either by retreating from, or approaching towards different countries.

Water and fire, the natures of which are so different, and even so contrary, produce similar effects, or, at least, those which appear to us as such. Water has produced mountains, and formed most islands. There are likewise caverns, clefts, holes, gulphs, &c.; some owe their origin to subterranean fires, and others to water.

Saint Patrick's CAVERN, in Ireland is not so considerable as it is famous; it is the same with the Dog's Grotto,* near Naples, and that which throws out fire in the mountain of Beniguaezeval, in the kingdom of Fez.

One of the most remarkable and largest caverns known, is that of Antiparos, an ample description of which has been given us by M. de Tournefort. It is computed to be three hundred fathoms deep from the surface of the earth; but the grotto appears to be forty fathoms high by fifty broad;

* It is so called because it produces in considerable quantity that kind of vapour which is called fixed air, and which being heavier than the common air rises only to about the height of two feet. As this air is mortal to all animals which breathe it, the dogs are suffocated, though men may walk in safety through the grotto.

it is filled with large, beautiful stalactites, or sparry pillars like isicles, of various forms, as well on the roof of the vault as at the bottom.

In that part of Greece which is called Livadia, (the Achaia of the ancients,) there is a large cavern in a mountain, which was formerly very famous for the oracles of Trophonius, between the lake Livadia, and the adjacent sea, which, in the nearest part, is forty miles over; there are forty subterranean passages across the rock, under a lofty mountain, through which the waters of the lake continually flow.

In the month of June, 1714, a part of the mountain of Diableret in Valois, fell suddenly, between two and three o'clock in the afternoon. The sky was very serene; the mountain was of a conical figure, and destroyed fifty-three huts belonging to the boors, and crushed to death fifteen people, and more than a hundred head of large, and much more of small cattle, covering a square league with the ruins it occasioned. A profound darkness was caused by the dust; the heaps of stones thrown together were above thirty perches; these heaps stopped the current of the water, which formed new and very deep lakes. In all this there was not the least trace of bituminous matter, sulphur, lime, nor consequently any subterranean fire; and apparently the base of this great rock was worn away, or perished and reduced to dust.*

We have a remarkable example of these sinkings near Folkstone, in the county of Kent. The hills in its environs have sunk gradually, by an imperceptible motion and without any earthquake. The hills internally are rocks of stone and chalk. By this sinking, they have thrown into the sea rocks and earths which were adjacent to it.

When the waters on the surface of the earth cannot find vent to flow, they form MORASSES and BOGS. The most famous morasses in Europe, are those of Muscovy at the source of the Tanais; those of Finland, where the great morasses of Savolax and Enasak are; there are also some in Holland, Westphalia, and many other low countries; in Asia, the morasses of the Euphrates, those of Tartary, and the Palus Meotidis; nevertheless, in general, there are fewer of them in Asia and Africa than in Europe; but America may be said to be but one continued morass, throughout all its plains. This great number of morasses

is a proof of the modern date of the country, and of the small number of inhabitants, and still more of their want of industry.

A circumstance related by Dr. Plot will serve to give an idea of the quantity of earth which the rain detaches from the mountains, and carries along with it into the valleys: in his Natural History of Staffordshire, he says, that, eighteen feet deep in the earth, a great number of pieces of money coined in the reign of Edward V. have been found; i. e. two hundred years before his time; so that this ground, which is boggy, has increased above a foot in eleven years, or an inch and a twelfth every year. We may still make a similar observation on trees buried at 17 feet depth, below which medals of Julius Cæsar have been found; so that the earth brought from the tops of mountains into plains by running waters, serves very considerably to increase the elevation of the ground of plains.

It is evident, that considerable changes have taken place on the surface of the globe, not only by the action of fire, but by water also. The sea, from various circumstances, has repeatedly changed its bed. Authors have suspected, that the island of Great Britain was formerly united to the continent of France. On the coasts of France, England, Holland, and Germany, the sea has retreated in many parts. In Italy a considerable tract of territory has been gained by the retreating of the ocean; and Ravenna, which was formerly a sea-port of the Exarques, is no longer a maritime town.

In the city of Modena, and four miles round, whatever part is dug, when we reach the depth of sixty-three feet, and bore five feet deeper with an auger, the water springs out with such force, that the well is filled in a very short space of time. This water flows continually, and neither diminishes nor increases by the rain or drought. What is remarkable in this ground is, that when we reach the depth of fourteen feet, we find pavements, and other ruins of an ancient town, as boards, houses, different pieces of mosaic work, &c. after which we find a very solid ground, which is thought to have never been stirred; yet below it there is a moist earth mixed with vegetables; and at twenty-six feet are entire trees, as nut-trees, with nuts on them, and a great quantity of branches and leaves of trees; at twenty-eight feet depth, we meet with a friable chalk, mixed with many shells; and this bed is eleven feet in thickness; after which we again meet with vegetables, and so on alternately chalk and earth mixed with vegetables, to the

depth of sixty-three feet; at which depth is a bed of sand mixed with some gravel and shells, like those formed on the coasts of the Italian sea. These successive beds of fenhy or marshy earth and chalk are always met with in the same order, wherever we dig; and very often the auger meets with large trunks of trees, which it bores through, and which occasions great trouble to the workmen: bones, coals, flint, and pieces of iron, are also found. Ramazzini, who relates these circumstances, thinks that the gulph of Venice formerly extended as far and even beyond Modena; and that, by course of time, and perhaps by the inundations of the sea, this ground has been formed.

On the mountain of Stella, in Portugal, is a lake, in which the wrecks of ships have been found, notwithstanding this mountain is more than twelve leagues distant from any sea. Sabinus, in his Commentaries on Ovid's Metamorphoses, says, that by the monuments of history it appears, that in the year 1460, a whole ship, with its anchors, was found in a mine of the Alps.

CHAP. V.

Of the Nature of Man.—Of Infancy.—Manhood.—Extent of Human Life.—Of the Senses.—Anecdotes illustrative of this Subject.

MAN is a being compounded of two distinct natures, body and soul. The soul exists independent of the senses, but receives all its information by their means. The leper whose skin is dried up, has no sense of external feeling: and a man deaf from infancy, has no ideas of sounds. But to give a more perfect idea of the nature of man, it will be proper to pursue him through the different stages of his existence.

At his birth, the INFANT is exposed to a new element, the air. What the sensations are on the admission of this element into the lungs, it is impossible to guess; but, from the cries of the infant, we may conjecture that it is attended with pain. The eyes of an infant are, indeed, open, but they are dull, and appear to be unfitted for the performance of any office whatever; and the outward coat of them is wrinkled. The same reasoning will apply to most of the other senses. It is not till after forty days that it

begins to smile; nor is it till then that it begins to weep: its former sensations of pain are unaccompanied with tears. The size of an infant born at the full time, is twenty-one inches, though some do not exceed fourteen: and it generally weighs twelve, and sometimes fourteen pounds. The form of the body and members of a new-born infant are by no means perfect. At the end of three days, there usually appears a kind of jaundice: and at that time, there is generally milk in the breast of the infant, which is squeezed out with the fingers. The skull of infants is not completely formed: in the language of the nursery, the head is OPEN in a particular part; that is, the skull bones have not yet grown far enough to meet. In this opening, a palpitation may sometimes be discovered; and the beating of the arteries may always be felt. Above this opening, a species of scurf appears, which is rubbed off with a brush. In this country, infants as soon as born, are injudiciously and unnaturally laced with bandages; so that they are not able to move a single joint. Nations which we call barbarous, act more rationally and more humanely in this respect. The Siamese, the Indians, the Japanese, the Negroes, the savages of America, lay their infants naked in hanging beds of cotton, or in cradles lined with fur.

Infants sleep much, but their sleep is often interrupted. They ought to have the breast every two hours in the day, and in the night as often as they awake. It is of great importance to keep children clean and dry from their excrements. The American Indians, who cannot change their furs as frequently as we can our clothes, put under them the dust of rotten wood, and renew it as often as it becomes damp. Great evils ensue from the negligence of nurses. Infants are sometimes left to cry for a considerable time, which often occasions diseases, or, at least, throws them in a state of lassitude, which deranges their constitutions. To palliate this they are sometimes put into a cradle and rocked to sleep, which may occasionally derange the stomach and head. Before children are put into the cradle, we ought to be certain that they want nothing, and when they are rocked, it ought never to be with such violence as to stun or stupefy them. The eyes of children are always directed towards the light, and if one eye only be directed to it, the other will probably become weak; both eyes ought, therefore, to be equally shaded, or equally exposed. Squinting is commonly the effect of injudicious treatment in this respect. For the first two or three months

the diet of the infant ought chiefly to be confined to its mother's milk.

The eight incisores, or fore-teeth, appear first. They are produced generally by pairs, and from two months old to ten or twelve. The four canini (or dog teeth) appear commonly about the 9th or 10th month. About the close of the first, or in the course of the second year, sixteen other teeth appear, called *molars*, or grinders. In the 5th, 6th, or 7th year the fore teeth, the dog-teeth, and the first six of the grinders, naturally shed, and a new set appears. At the age of puberty, or later, the *dentes sapientiæ*, or wise teeth appear. Women are said to have fewer teeth than men.

The hair of most infants is exceedingly light, almost white. When a child is suffered to cry violently, and too long, it is in danger of a rupture, but the early application of bandages or trusses will frequently remove the complaint.

The frame of infants is said (perhaps erroneously) to be less sensible of cold than during any other season of life. The pulse is certainly strong, and it is, therefore, fair to conclude, that the internal heat is considerable. Till the age of three years the life of infants is extremely precarious:* in the course of the ensuing second and third years it becomes more certain, and at six or seven a child has a greater probability of living than at any other period of life. It is remarked, that of a certain number of children born at the same time, above a fourth die in the first year; above a third in two years, and at least one half in three years. By other calculations, it appears that one half of the children born at the same time, are not extinct in less than seven or eight years.

At 12 or 15 months infants begin to lisp. A is the vowel which they pronounce with most ease. Of the consonants B, M, P, T, are most easy. In every language, therefore, *Baba, Mama, Papa*, are the first words that children learn. Some children pronounce distinctly in two years, though the generality do not speak for two years and a half, and frequently not so early.

* It is rendered still more so by injudicious treatment. Vegetable diet and frequent purges murder innumerable poor infants. As the animal frame is in a state of debility at this period of life, strengthening animal food is certainly most proper; and, as the intestines are generally inclined to a state of relaxation, frequent purges are certain to be destructive. Editor.

Some young persons cease growing at 14 or 15, while others continue their growth to 22 or 23. In men the body attains its perfect proportion at the age of 30, and in women sooner. The persons, indeed, of women, are generally complete at 20. The distance between the eyes is less in man than in any other animal; in some creatures, in fact, the eyes are at so great a distance, that it is impossible they should ever view the same object with both eyes at once. Men and apes are the only animals that have eye-lashes on the lower eyelid. Other animals have them on the upper, but want them on the lower lid. The upper lid rises and falls, the lower has scarcely any motion.

The ancients erroneously considered the hair as a kind of excrement, and believed that, like the nails, it increased by the lower part putting out the extremity; but the moderns have discovered that every hair is a tube, which fills and receives nutriment like the other parts of the body. The roots, they observe, do not turn grey sooner than the extremities, but the whole changes colour at once. Instances have been known of persons who have grown grey in one night.

There is no part of the body which has been subject to such changes of fashion as the hair and the beard. Some people, and among others the Turks, cut the hair off their heads, and let their beards grow. The Europeans, on the contrary, shave their beards and wear their hair. The negroes shave their heads in figures at one time, in stars at another, in the manner of friars; and still more commonly in alternate stripes; and their little boys are shaved in the same manner. The Talapoins, of Siam, shave the heads and the eye-brows of such children as are committed to their care. Every nation seems to have entertained different prejudices, at different times, in favour of one part or another of the beard.

The neck supports the head, and unites it to the body. This part is much more considerable in the generality of quadrupeds, than in man. But fishes, and other animals that have not lungs similar to ours, have no neck whatever. Birds, in general, have the neck longer than any other kind of animal: those of them which have short claws, have also short necks; those, on the contrary, that have them long, are found to have the neck in proportion.

The human breast is outwardly formed in a very different manner from that of other animals. It is larger in

proportion to the size of the body; and none but man and such animals as make use of their fore feet as hands, such as monkeys, bats, and squirrels, are found to have those bones called clavicles, or, as we usually term them, collar bones. The breasts in women are larger than in men; however, they seem formed in the same manner; and, sometimes, milk is found in the breasts of men, as well as in those of women. Birds, and all other oviparous* animals, have no teats; but viviparous † fishes, as the whale and the dolphin, have both teats and milk.

There is little known exactly with regard to the proportion of the human figure; and the beauty of the best statues is better conceived by observation than by measurement. Some who have studied after the ancient masters, divide the body into ten times the length of the face; and others into eight. They tell us, that there is a similitude of proportion in different parts of the body; thus: that the hand is the length of the face; that the thumb is the length of the nose; that the space between the eyes is the breadth of the eye; that the breadth of the thickest part of the thigh is double that of the thickest part of the leg, and treble the smallest; that the arms extended are as long as the figure is high; that the legs and thighs are the length of the figure.

The strength of man is very considerable when matured by practice. We are assured, that the porters of Constantinople carry burthens of not less weight than nine hundred pounds; and M. Desaguliers tells us of a man in an upright posture, who by distributing a certain number of weights, in such a manner that every part of his body bore its share, was able to support a weight of two thousand pounds.

The strength of a man may be still farther estimated by the continuance of his labour, and by the agility of his motions. Men, who are exercised in running, outstrip horses, or at least continue their speed for a greater length of time. In a journey, also, a man will walk down a horse; and after they have proceeded together for several days, the horse will be quite tired, and the man will be as fresh as at the beginning. The royal messengers of Ispahan, who are runners by profession, go thirty-six leagues in fourteen or fifteen hours. Travellers assure us, that

* Those which breed from eggs.

† Those which produce their young alive, and without eggs.

the Hottentots out-run lions in the chase; and that the savages who hunt the elk, pursue with such speed this animal, which is as fleet as a stag, that they at last tire it down, and take it. The civilized man is ignorant of his own strength, nor is he sensible how much he loses of it by effeminacy, and how he might add to it by the habit of vigorous exercise.

Lest our description of man should be found imperfect, it will be proper to examine the human countenance, as it appears among ourselves, when agitated by the *PASSIONS*. In affliction, in excessive joy, in love, in shame, in compassion, the eyes are apt to be swelled, and in a manner obscured, by an overflow of tears. The effusion of these is always accompanied with a tension of the muscles of the visage, by which there is occasioned an opening of the mouth. At the same time, the natural moisture in the nose becomes more copious, and, by internal passages, blends itself with the lachrymal moisture; which does not however, flow uniformly, but at intervals.

In sorrow, the two corners of the mouth are lowered, the middle of the under lip is raised, the eye-lid is half closed, the pupil of the eye is raised, and almost covered with the eye-lid, and the other muscles of the face are so much relaxed that the space between the mouth and the eyes is larger than ordinary, and of consequence the countenance appears lengthened.

In fear, terror, or horror, the forehead is wrinkled, the eye-brow is raised, the eye-lids are as much as possible extended, and discover a part of the white of the eye over the pupil; which is lowered, and somewhat concealed by the inferior eye-lid; the mouth at the same time is widely opened, and the lips being separated, both the upper and under teeth are seen.

In contempt and derision, the upper lip is raised on one side, and on the other there is a little motion, as if in order to smile; the nose is shrivelled on the same side that the lip is raised, and the corner of the mouth is extended; the eye on the same side is almost shut, while the other is open as usual, but the pupil of each is lowered, as when one looks from high to low.

In jealousy, envy, and malice, the eye-brow falls down, and is knit, the eye-lid is raised, and the pupil lowered; the under lip is raised on each side, while the corners of the mouth are rather lowered, and the middle of the

under-lip is raised, in order to join the middle of the upper one.

In laughter, the two corners of the mouth are extended, and somewhat raised; the upper part of the cheeks is raised, and the eyes are more or less closed; the upper lip is raised, while the under one is lowered; and in immoderate laughter, the mouth is opened, and the skin of the nose is contracted.

When the constitution of the body is sound, it is possible, perhaps, by moderation in the passions, temperance and sobriety, to lengthen out the period of LIFE for a few years. But even of this there seems to be an uncertainty. Men, no doubt, there are, who have surpassed the usual period of human existence; and, not to mention Parr, who lived to the age of one hundred and forty-four, and Jenkins to that of one hundred and sixty-five, as recorded in the *Philosophical Transactions*; we have many instances of the prolongation of life to one hundred and ten, and even to one hundred and twenty years. Yet this longevity was occasioned by no peculiar art or management. On the contrary, it appears that the generality of such long-livers were peasants, accustomed to the greatest fatigues, huntsmen, or labourers; men, in fact, who had employed their whole bodily strength, and even abused it, if to abuse it is possible, otherwise than by continual idleness and debauchery.

If in the duration of life there is any difference to be found, it ought seemingly to be ascribed to the quality of the air. In elevated situations, it has been observed, there are commonly found more old people than in such as are low. The mountains of Scotland and Wales, of Auvergne and Switzerland, have furnished more instances of extreme longevity than the plains of Holland or Flanders, of Germany or Poland. In general, however, the period of human existence may be said to be the same in every country. If not cut off by accidental diseases, man is found to live to the years of ninety or an hundred. Beyond that date our ancestors did not live; nor has it in any degree varied since the time of David.

From a careful inspection of the registers of burials in a certain number of country parishes in France, compared with the mortality of Paris, the following table has been made out of the probable duration of human life.

TABLE

OF THE

Probabilities of the Duration of Life.

Age.	Duration of Life.		Age.	Duration of Life.		Age.	Duration of Life.	
Years.	Years.	Months.	Years.	Years.	Months.	Years.	Years.	Months.
0	8	0	29	28	6	58	12	3
1	33	0	30	28	0	59	11	8
2	38	0	31	27	6	60	11	1
3	40	0	32	26	11	61	10	6
4	41	0	33	26	3	62	10	0
5	41	6	34	25	7	63	9	6
6	42	0	35	25	0	64	9	0
7	42	3	36	24	5	65	8	6
8	41	6	37	23	10	66	8	0
9	40	10	38	23	3	67	7	6
10	40	2	39	22	8	68	7	0
11	39	6	40	22	1	69	6	7
12	38	9	41	21	6	70	6	2
13	38	1	42	20	11	71	5	8
14	37	5	43	20	4	72	5	4
15	36	9	44	19	9	73	5	0
16	36	0	45	19	3	74	4	9
17	35	4	46	18	9	75	4	6
18	34	8	47	18	2	76	4	3
19	31	0	48	17	8	77	4	1
20	33	5	49	17	2	78	3	11
21	32	11	50	16	7	79	3	9
22	32	4	51	16	0	80	3	7
23	31	10	52	15	6	81	3	5
24	31	8	53	15	0	82	3	3
25	30	9	54	14	6	83	3	2
26	30	2	55	14	0	84	3	1
27	29	7	56	13	5	85	3	0
28	29	0	57	12	10			

By this Table it appears, that it is reasonably to be expected, or, in other words, that we may lay an even wager, that an infant newly born will live eight years; that an infant of one year will live thirty three years longer; that an infant of two years will live thirty-eight years longer; that a man of twenty will live thirty-three years and five months longer; that a man of thirty will live twenty-eight years longer; and so proportionably of every other age.

IDEAS of external things are conveyed to the soul of man by means of the five SENSES, *seeing, hearing, feeling, tasting, and smelling*. The organs by which the senses act are the nerves, which are small thread-like fibres, distributed all over the body, and all of them connected with the brain.

The eyes seem to be formed very early in the human embryo. In the chicken, also, of all the parts that are double, these are the soonest produced: and it is observed from the eggs of several sorts of birds, as well as those of lizards, that the eyes were much larger and more early in their expansion, than any other parts of the two-fold growth. Though, in viviparous animals, and particularly in man, they are at first, by no means so large in proportion as in the oviparous classes, yet they obtain their due formation sooner than any other parts of the body. Thus it is also with the organ of hearing. The little bones that help to compose the internal parts of the ear, are entirely formed before any of the other bones, however large they may afterwards become, have acquired any part of their growth or solidity. Hence it is evident, that the parts of the body which are furnished with the greatest quantity of nerves, are those which appear the soonest, and which are the soonest brought to perfection.

Mr. Cheselden having couched for a cataract a boy of thirteen years of age, who had been blind from his birth, and having thus communicated to him the sense of seeing, was at great pains to mark the progress of his visual powers. This youth, though hitherto incapable of seeing, was not however, absolutely and entirely blind. Like every other person, whose vision is obstructed by a cataract, he could distinguish day from night, and even black from white, or either, from the vivid colour of scarlet. Of the form of bodies, however, he saw nothing, nor of colours themselves, unless the light was strong. At first,

the operation was performed only upon one of his eyes ; and when he saw for the first time, so far was he from forming the smallest conception of distances, that he supposed (as he himself expressed it) every thing he saw touched his eyes, in the same manner as every thing he felt touched his skin. The objects that pleased him most were those of which the surfaces were plain, and the figures regular ; though as yet he could in no degree judge of their different forms, or assign a reason why some were more agreeable to him than others. The ideas he had entertained of colours, during his former dark state, were so imperfect that when he saw them in reality, he could hardly be persuaded they were the same. When such objects were shewn him as he had been formerly familiar with, by the touch, he observed them with earnestness, in order to distinguish them a second time. As of these, however, he had too many to retain all at once, the greatest number were forgotten ; and for one thing which he knew, after seeing it, there were a thousand things, according to his own declaration, of which he no longer possessed the smallest remembrance. He was very much surprised to find that those persons, and those things which he had loved best, were not the most pleasing to the eye ; nor could he help testifying his disappointment in finding his parents less handsome than he had conceived them to be. Before he could distinguish that a picture resembled a solid body, about two months elapsed. Till then, he only considered it as a surface diversified by a variety of colours : but when he began to perceive that these shadings actually represented human beings, he also began to examine, by the touch, whether they had not the usual qualities of such bodies ; and great was his surprise to find smooth and even, what he had supposed a very unequal surface. He was then shewn a miniature-portrait of his father, which was contained in his mother's watch-case ; and though he readily perceived the resemblance, yet he expressed his amazement, how so large a face could be comprised in so small a compass. To him it appeared as strange as that a pint vessel should contain a bushel. At first he could bear but a very small quantity of light, and he saw every object much greater than life ; but in proportion as he observed objects that were in reality large, so in proportion he conceived the others to be diminished. Beyond the limits of what he saw, he had no conception of any thing. He knew that the apartment he occupied was only a part of

the house; and yet he could not imagine how the latter should appear larger than the former. Before the operation, he formed no great expectations of the pleasures he should receive from the new sense he was promised. That he might be enabled to read and write, was his grand object. He said, among other things, that he could enjoy no greater delight from walking in the garden, with this sense, than without it; because there he already walked at his ease, and was acquainted with all the walks. With great truth he also remarked, that his blindness gave him one advantage over the rest of mankind; an advantage which, indeed, he preserved for a long time after he had obtained the sense of seeing; namely, that of being able to walk in the night with confidence and security. No sooner, however, had he begun to enjoy this new sense, than he was transported beyond measure; and he declared, that every new object was a new source of delight to him; that his pleasure was so great he had not language to express it. About a year after, he was carried to Epsom, where there is a very beautiful, and a very extensive prospect: with this he seemed greatly charmed; and the landscape before him he called a new method of seeing. He was couched in the other eye, a year after the former, and of both operations the success was equally great. When he saw with both eyes, every object appeared to him twice as large as when he saw but with one eye, though he did not see double, or at least he shewed no marks from which any such conclusion might be drawn.

We judge of distance only by experience, otherwise, when experience does not set us right, the more distant an object is, the smaller it appears. When, from particular circumstances, we cannot form a just idea of distance, and when we cannot judge of objects but by the angle, or rather the image, which they form in our eyes, we are then necessarily deceived as to the size of such objects. Every man has experienced how liable we are in travelling by night to mistake a bush which is at hand for a tree which is at a distance, or, indeed, a tree which is at a distance for a bush which is at hand. In the same manner if we do not distinguish objects by their form, and if thereby we cannot judge of distance, the same fallacy will still remain; in this case, a fly, which may pass with rapidity immediately before our eyes, will appear to be a bird at a considerable distance; and a horse which may be in the middle of a plain, without motion, and in an attitude similar, for ex-

ample, to that of a sheep, will appear no larger than a sheep, till we have once discovered that it is a horse.

Whenever, therefore, we find ourselves benighted in an unknown place, where no judgment is to be formed of distance, we are every moment liable to deceptions of vision; hence originate the dreadful anecdotes of SPECTRES, and those strange, hideous, and gigantic figures, which so many persons tell us they have seen. Though such appearances, it is commonly asserted, exist solely in the imagination, yet it is highly possible that they might appear literally to the eye, and be in every different respect seen as described to us. That this remark is consonant to truth, will be allowed to be the more probable when we reflect, that whenever we cannot judge of an object except by the angle which it forms in the eye, this object is magnified in proportion to its nearness; and that if it appeared, at first to the spectator who is alike incapable of distinguishing what he sees, and of judging at what distance he sees it; if it appeared, for instance, when at the distance of twenty or thirty paces, a few feet high, it must appear to him, when advanced to within a few feet of it, of a size stupendously increased. At this he must naturally be astonished and terrified, till he comes to touch the seemingly gigantic object, and to distinguish it; for in the very instant that he has an actual perception of what it is, the object will diminish; and appear to him as it in reality is. If, on the other hand, he is afraid to approach it, and he flies from the spot with precipitation, the only idea he will have of what had presented itself to him, will be that of the image that had been formed in his eye; the image of a figure he had seen, gigantic in its size, and horrible in its form. The prejudice with respect to spectres, therefore, originates from nature; and such appearances depend not, as philosophers have supposed, solely upon the imagination.

As the sense of sight is the effect of the action of light upon the eye, it is well known, that too much light is extremely prejudicial, as well as too little.* Travellers, who cross countries covered with snow, are obliged to

* It is, however, surprising how far the eye can accommodate itself to darkness, and make the best of a gloomy situation. When first taken from the light, and brought into a dark room, all things disappear; or, if any thing is seen, it is only the remaining radiations that still continue in the eye. But after a very little time, when these are spent, the eye takes advantage of the smallest ray that happens to enter; and this alone would,

wear a crape before their eyes. Persons, therefore, who read or write much should accustom themselves to moderate light.

There are many reasons to induce us to suppose that such persons as are short-sighted see objects larger than others; and yet it is a certain truth that they see them less.

Error is, however, not confined to any one sense; and that of HEARING is liable to similar mistakes with that of sight. This sense conveys no distinct intelligence of the distance whence a sounding body is heard: a great noise far off, and a small one very near, produce the same sensation; and unless we receive information from some other sense we can never distinctly tell whether the sound be a great or a small one. It is not till we have, by experience, become acquainted with any particular sound, that we can judge of the distance when we hear it. When, for example, we know the tone of a bell, we are then at no great loss to determine how far it is from us.

The air is the principle means of conveying the sound.* Sound is in effect always a vibration or wave-like motion, communicated by other bodies to the air, and to our senses by the air striking on our auditory nerve.

Every body that strikes against another produces a sound which is simple in such bodies as are not elastic, but which is often repeated in such as are. If we strike a bell, for instance, a single blow produces a sound, which is repeated by the undulations of the sonorous body, and which is multiplied as often as it happens to undulate or vibrate. These undulations succeed each other so fast, that the ear

in time, serve for many of the purposes of life. There was a gentleman of great courage and understanding, who was a major under King Charles the First. This unfortunate man sharing in his master's misfortunes, and being forced abroad, ventured, at Madrid, to do his king a signal service; but unluckily failed in the attempt. In consequence of this, he was instantly ordered to a dark and dismal dungeon, into which the light never entered, and into which there was no opening but by a hole at the top; down which the keeper put his provisions, and presently closed it again on the other side. In this manner the unfortunate loyalist continued for some weeks, distressed and disconsolate; but, at last, began to think he saw some little glimmering light. This internal dawn seemed to increase from time to time, so that he could not only discover the parts of his bed, and such other large objects, but, at length, he even began to perceive the mice that frequented his cell; and saw them as they ran about the floor, eating the crumbs of bread that happened to fall. After some months confinement he was at last set free; but such was the effect of the darkness upon him, that he could not for some days venture to leave his dungeon, but was obliged to accustom himself by degrees to the light of the day.

* The strokes of a bell give no sound, when it is placed under the receiver of an air-pump which is exhausted of its air.

supposes them one continued sound ; whereas, in reality, they form many sounds. Sounding bodies, are, therefore, of two kinds ; those unelastic ones, which being struck, return but a single sound ; and those more elastic, returning a succession of sounds, which uniting together form a tone. This tone may be considered as a great number of sounds, all produced one after the other, by the same body, as we find in a bell which continues to sound for some time after it is struck. A continuing tone may be also produced from a non-elastic body, by repeating the blow quick and often, as when we beat a drum, or when we draw a bow along the string of a fiddle.

To know the manner in which musical sounds become pleasing, it must be observed, that no one continuing tone, how loud or swelling soever, can give us satisfaction ; we must have a succession of them, and those in the most pleasing proportion. The nature of this proportion may be thus conceived. If we strike a body incapable of vibration with a double force, or what amounts to the same thing, with a double mass of matter, it will produce a sound that will be doubly grave. Music has been said, by the ancients, to have been first invented from the blows of different hammers on an anvil. Suppose then we strike an anvil with a hammer of one pound weight, and again with an hammer of two pounds, it is plain that the two pound hammer will produce a sound twice as grave as the former. But if we strike with a two pound hammer, and then with a three pound, it is evident that the latter will produce a sound one third more grave than the former. If we strike the anvil with a three pound hammer, and then with a four pound, it will likewise follow that the latter will be a quarter part more grave than the former. Now, in comparing all those sounds, it is obvious that the difference between one and two is more easily perceived than between two and three, three and four, or any numbers succeeding in the same proportion. The succession of sounds will be, therefore, pleasing in proportion to the ease with which they may be distinguished. That sound which is double the former, or, in other words, the octave to the preceding tone, will among all other be the most pleasing harmony. The next to that, which is as two to three, or, in other words, the third will be most agreeable. And thus universally, those sounds whose differences may be most easily compared are the most agreeable.

Sound has, in common with light, the property of being extensively diffused. Like light, it also admits of reflection. The laws of this reflection, it is true, are less distinctly understood than those of light: all we know is, that sound is principally reflected by hard bodies, and that their being hollow also sometimes increases the reverberation. The internal cavity of the ear, which is fashioned out in the temporal bone, like a cavern cut into a rock, seems to be fitted for the purposes of echoing sound with the greatest precision.

One of the most common complaints in old age is deafness; which probably proceeds from the rigidity of the nerves in the labyrinth of the ear. This disorder also proceeds sometimes from a stoppage of the wax, which art may easily remedy. In order to know whether the defect be an internal or an external one, let the deaf person put a repeating watch into his mouth, and if he hears it strike, he may be assured that his disorder proceeds from an external cause, and may be in some measure cured.

It often happens that people hear better with one ear than another; and these, it is observed, have what musicians call a bad ear. I have made many trials on persons thus circumstanced; and I have always found that their defect in judging properly of sounds proceeds from the inequality of their ears, and their receiving, by both at the same time, unequal sensations. In like manner, as such persons hear false, they, also, without knowing it, sing false. They also frequently deceive themselves with regard to the side whence the sound comes, generally supposing the noise to come on the part of the best ear.

Hearing is a much more necessary sense to man than to animals. In these it is only a warning against danger, or an encouragement to mutual assistance. In man, it is the source of most of his pleasures; and without it the rest of his senses would be of little benefit. A man born deaf, must necessarily be dumb; and his whole sphere of knowledge must be bounded by sensual objects. We have a singular, and perhaps an unexampled instance of a young man, who, being born deaf, was restored at the age of twenty-four, to perfect hearing. The account, which is given in the memoirs of the Academy of Sciences, 1703, page 18, is in substance as follows:—

“A young man of the town of Chartres, between the age of twenty-three and twenty-four, the son of a tradesman, and deaf and dumb from his birth, began so speak

all of a sudden, to the utter astonishment of the whole town. He gave them to understand that, about three or four months before, he had heard the sound of the bells, and was greatly surprised at this new and unknown sensation. After some time, a kind of water issued from his left ear, and he then heard perfectly well with both. During these three months he was sedulously employed in listening without saying a word, and accustoming himself to speak softly, so as not to be heard, the words pronounced by others. He laboured hard also in perfecting himself in the pronunciation, and in the ideas attached to every sound. At length having supposed himself qualified to break silence, he declared that he could now speak, though as yet but imperfectly. Soon after some able divines questioned him concerning his ideas of his past state; and principally with respect to God, his soul, the moral beauty of virtue, and deformity of vice. The young man, however, had not directed his solitary speculations into that channel. He had gone to mass indeed with his parents, had learned to sign himself with the cross, to kneel down, and to assume all the grimaces of a man in the act of devotion. But he did all this without any manner of knowledge of the intention or the cause; he saw others do the like, and that was enough for him. He knew nothing even of death, nor did it ever enter into his mind; he led a life of pure animal instinct; and though entirely taken up with objects of sense, and such as were present, he did not seem to have made such reflections even upon these, as might reasonably have been expected. The young man was not, however, deficient in understanding: but the understanding of a man, deprived of all commerce with others is so very confined, that the mind is in some measure totally under the control of its immediate sensations."

It is highly possible, nevertheless, to communicate ideas to deaf men, which they previously wanted, and even to give them very precise notions of abstract, and general subjects, by means of signs, and of letters. A person born deaf may, by time and application, be taught to read, to write, and even, by the motion of the lips, to understand what is said to him; a plain proof how much the senses resemble, and supply the defects of each other. It is probable, however, that, as most of the motions of speech are made within the mouth by the tongue, the knowledge from the motion of the lips can be but very confined.

The sense of **FEELING** is spread over the whole body, but it employs itself differently in different parts. The sentiment which results from feeling cannot be excited otherwise than by the contact and immediate application of the superficies of some foreign body to that of our own. If we apply a foreign body against the breast, or upon the shoulder of a man, he will feel it; that is, he will know that there is a foreign body which touches him: but he will not have a single idea of the form of this body, because the breast touching the body in a single plain, or surface, he cannot gather from it any knowledge of this body. It is the same with respect to all other parts of the body, which cannot adjust themselves upon the surface of foreign bodies, and bend themselves, to embrace at one time, many parts of their superficies. These parts of our body cannot, therefore, give any just idea of their form; but those which, like the hand, are divided into many small flexible and moveable parts; and which consequently, can apply themselves at one and the same time, upon the different plains of the superficies of the body, are those, which in effect, give us the ideas of their form, and of their size.

It is not, therefore only because there is a greater quantity of nervous tufts, at the extremity of the fingers than in any other part of the body; it is not, as it is vulgarly pretended, because the hand has the most delicate sense, that it is in effect the principal organ of feeling; on the contrary, we can say, that there are parts more sensible, and where the sense of feeling is more delicate, as the eyes, the tongue, &c. but it is merely because the hand is divided into many parts all moveable, all flexible, all acting at one and the same time, and all obedient to the will; it is because the hand is the only organ which gives us distinct ideas of the form of bodies. Animals which have hands, appear to be the most acute: apes do things so resembling the mechanical actions of man, that it seems as if they had the same succession of corporeal sensation for the cause of them. Animals, which are deprived of this organ cannot have any knowledge distinct enough of the form of things; as they cannot grasp any object, and as they have not any part divided and flexible enough to be able to adjust itself upon the superficies of bodies, they certainly have not any precise notion of the form, any more than of the size of them. It is for this reason that we often see them in suspense, or frightened at the aspect of objects

with which they ought to be the best acquainted, and which are the most familiar to them. The principal organ of their feeling is the muzzle, because this part is divided in two by the mouth, and because the tongue is another part, that serves them at the same time to touch bodies, which we see them turn and turn again before they take them between their teeth.

It is therefore to the sense of feeling that we are indebted for the power of usefully exercising all our other faculties. One man does not, perhaps, possess more ingenuity or capacity than another, but because in his earliest infancy he made a greater, and a readier use of this sense. As soon as children are indulged with the liberty of their hands, they presently bring them into action, and are fond of touching whatever is presented to them. They are seen to amuse themselves, and take pleasure in handling every thing they are capable of grasping; they seem as if they were endeavouring to find out the form of bodies, by touching them on every side; and for a considerable time, they amuse themselves in this manner, or rather they inform themselves of new objects. In the rest of our life we ourselves, if we reflect upon it, amuse ourselves in a different method, in doing, or in seeking to do, any thing that is new.

Of the senses of SMELLING and TASTING there is little to be said worthy of observation. It is evident, that with respect to the first of these, there are animals which are infinitely superior to man; and perhaps there may exist creatures which in delicacy of taste may as much surpass the voluptuary, as the beagle does in acuteness of scent.

CHAP. VI.

Of the apparent varieties in the human species—Laplanders—Tartars—Chinese—Japanese—Formosans—Moguls—Persians—Arabians—Egyptians—Circassians—Turks—Russians—Negroes—Hottentots—Americans—Causes of this variety—Accidental varieties—White negroes—Pied negroes—The porcupine man—Curious child—Negro that from black became white—Dwarf—Curious wedding—History of Baby—Giants—Affecting narrative of two extraordinary twins.

THERE are many causes which contribute to the producing of an apparent variety between the different nations of the globe. Climate, food, manners, and customs, produce not only a difference in sentiment, but even in the external form of a different people.

In examining the surface of the earth, and beginning our enquiries from the north, we find in Lapland, and in the northern parts of Tartary, a race of small-sized men, whose figure is uncouth, and whose physiognomy is as wild as their manners are unpolished. Though they seem to be of a degenerate species, they yet are numerous, and the countries they occupy are extensive.

The LAPLANDERS, the Danes, the Swedes, the Muscovites, the inhabitants of Nova-Zembla, the Borandians, the Samoids, the Ostiaks of the old continent, the Greenlanders, and the savages to the north of the Esquimaux Indians of the new continent, appear to be of one common race, which has been extended and multiplied along the coasts of the northern seas, and over deserts, considered as uninhabitable by every other nation. In these countries the visage is large and broad, the nose is flat and short, the eyes are of a yellowish brown, inclining to black, the eyelids are drawn toward the temples, the cheek-bones are extremely prominent, the mouth is very large, the lower part of the countenance is very narrow, the lips are thick and turned outward, the voice is shrill, the head is bulky, the hair is black and straight, and the skin is tawny. They are small in stature, and, though meagre, they yet are of a squat form. In general, their size is about four feet, nor do the tallest exceed four feet and a half; and among these people, if there is any difference to be

found, it depends on the greater or less degree of deformity.

The Danish Laplanders have a large black cat, which they make a confidant of all their secrets, and a counsellor, in all their difficulties. Among the Swedish Laplanders, there is in every family a drum for the purpose of consulting the devil; and though the natives of these countries are robust and nimble, from many circumstances there is reason to suppose, that they cannot live but in their own country, and in their own manner. In travelling over the ice and snow, they use skates made of fir, which are in length about two feet, and in breadth about half a foot, and which are raised and pointed before, and fastened to the foot by straps of leather. With these they make such dispatch, that they easily overtake the swiftest animals. They also use a pole, pointed with iron at one end, and rounded at the other. This pole serves to push them along, to direct their course, to keep them from falling, to stop the impetuosity of their career, and to kill what game they overtake. With their skates they descend the steepest mountains, and scale the most craggy precipices; nor are the women less skilful in such exercises than the men. They are all accustomed to the bow and arrow; and it is asserted, that the Muscovite Laplanders lance a javelin with so much dexterity, that at the distance of thirty paces, they are sure to hit a mark no longer than a silver crown, and with such force, that it will transfix a human body. As hunters, their favourite pursuit is that of the ermine, the fox, the lynx, and the martin; and of these animals, they barter their skins for their favourite articles of luxury, brandy and tobacco.

In winter the Laplanders clothe themselves with the skin of the rein-deer, and in summer with the skins of birds. To the uses of linen they are utter strangers. The women of Nova-Zembla have their nose and their ears pierced, in order to have them ornamented with pendants of blue stone; and also, as an additional lustre to their charms, they form blue streaks upon their forehead and chin. Those of Greenland dress themselves with the skin of the dog-fish: they also paint the visage with blue and yellow colours, and wear pendants in the ears. They all live under ground, or in huts almost entirely covered with earth, and with the bark of certain trees, or the skin of certain fishes; and some form subterranean trenches, by which one hut communicates to another, and by

which, during the winter-months, they enjoy the conversation and society of their neighbours. A continued series of darkness for several months, obliges them to illuminate their dreary abode with lamps, which they keep alive with that very train-oil they use as drink. Under all these hardships they are subject to few diseases, and live to a prodigious age. So vigorous indeed are the old men, that they are hardly to be distinguished from the young. The only infirmity they experience, and it is an infirmity common to them all, is that of blindness. Perpetually as they are dazzled by the strong reflection of the snow in winter, and as they are enveloped in clouds of smoke in autumn and spring, rarely, when advanced in years, are they still found to retain the use of their eyes.

The TARTAR country, taken in general, comprehends the greatest part of Asia, and in fact extends from Russia to Kamtschatka. In length, it occupies from eleven to twelve hundred leagues, and in breadth from seven hundred to seven hundred and fifty, a circumference twenty times larger than that of the whole kingdom of France.

All the Tartar nations have the upper part of the visage very large and wrinkled, even while yet in their youth. Their nose is short and flat, their eyes are little, and sunk in the head; their cheek-bones are high; the lower part of their visage is narrow; their chin is long and prominent; their teeth are long and straggling; their eye-brows are so large as to cover the eyes; their eye-lids are thick; the face is broad and flat; their complexion is tawny; and their hair is black. They have but little beard, have thick thighs, and short legs, and though but of middling stature, they yet are remarkably strong and robust. The ugliest of them are the Calmucks, in whose appearance there seems to be something frightful. They are all wanderers; and their only shelter is that of a tent, made of hair or skins. Their food is horse-flesh and camel-flesh, either raw, or a little sodden between the horse and the saddle. They eat also fish dried in the sun. Their most common drink is mare's milk, fermented with millet ground into meal. They all have the head shaved, except a tuft of hair on the top, which they let grow sufficiently long to form into tresses on each side of the face. The women, who are as deformed as the men, wear their hair, which

they bind up with bits of copper, and other ornaments of the same nature.

The majority of these tribes are alike strangers to religion, morality, and decency. They are robbers by profession; and the native of Daghestan, who live in the neighbourhood of more polished countries, carry on a great traffic of slaves, whom they carry off by force, and afterwards sell to the Turks and the Persians. Their wealth consists chiefly of horses, which are more numerous, perhaps, in Tartary, than in any other part of the world. They are taught, by custom, to live in the same place with their horses; they are continually employed in training and exercising them; and at length they reduce them to such implicit obedience, that they actually appear to understand, as it were, the intention of their riders.

Some travellers tell us, that the limbs of the CHINESE are well proportioned, that their body is large and fat, their visage large and round, their eyes small, their eye-brows large, their eye-lids turned upwards, their nose short and flat; that, as for their beard, which is black, upon the chin there is very little, and upon each lip there are not more than seven or eight prickles: that those who inhabit the southern provinces of the empire, are more brown and tawny than the others; that, in colour they resemble the natives of Mauritania, and the more swarthy Spaniards; but that those who inhabit the middle provinces, are as fair as the Germans.

Le Gentel assures us, that the Chinese women do every thing in their power to make their eyes appears little, and oblong; that, for this purpose, it is a constant practice with the little girls, from the instruction of the mother, forcibly to extend their eye-lids; and that, with the addition of a nose thoroughly compressed and flattened, of ears long, large, open, and pendant, they are accounted complete beauties. He adds, that their complexion is delicate, their lips are of a fine vermillion, their mouth is well-proportioned, their hair is very black; but that, by the use of paint, they so greatly injure their skin, that before the age of thirty, they have all the appearance of old age.

So strongly do the JAPANESE resemble the Chinese, that we can hardly scruple to rank them in the same class. As inhabitants of a more southern climate; they only differ from them in being more yellow, or more brown. In ge-

neral, their stature is contracted, their face, as well as their nose, is broad and flat, their hair is black, and their beard is little more than perceptible. They are haughty, fond of war, full of dexterity and vigour, civil and obliging, smooth-tongued, and courteous, but fickle and vain. With astonishing patience, and even almost regardless of them, they sustain hunger, thirst, cold, heat, fatigue, and all other hardships of life. Their ceremonies, or rather their grimaces, in eating, are numerous and uncouth. They are laborious, are very skilful artificers, and, in a word, have nearly the same disposition, the same manners, and the same customs as the Chinese.

One custom which they have in common, and which is not a little fantastic, is, so to contract the feet of the women, that they are hardly able to support themselves. Some travellers mention, that in China, when a girl has passed her third year, they break the foot in such a manner, that the toes are made to come under the sole; that they apply to it a strong water, which burns away the flesh; and, that they wrap it up in a number of bandages, till it has assumed a certain fold. They add, that the women feel the pain of this operation all their lives; that they walk with great difficulty; and that their gait is to the last degree ungraceful. Other travellers do not say that they break the foot in their infancy, but that they only compress it with so much violence as to prevent its growth; but they unanimously allow, that every woman of condition, and even every handsome woman, must have a foot small enough to enter, with ease, the slipper of a child of six years old.

Though the inhabitants of the kingdom of Pegu and Aracan are blacker, yet they all bear a considerable resemblance to the Chinese. Those of Aracan place great value upon a forehead large and flat; and, in order to render it so, they apply a plate of lead to the forehead of their children the minute they are born. Their nostrils are large, and extended; their eyes are small and lively; and their ears are of such a length as to hang over their shoulders. They feed without disgust on mice, on rats, on serpents, and on fish, however corrupted. Their women are tolerably fair, and their ears are as long as those of the men. The people of Achan, who are situated farther to the north than those of Aracan, have also a flat visage, and an olive-coloured skin; and such is the want of refinement, that they allow their boys to go quite naked, and their girls with

only a slight plate of silver over those parts which nature dictates to conceal.

Northward of the Philippine Islands is situated the island of FORMOSA, of which the natives, though situated at no great distance from the coast of Fokian in China, discover, however, no resemblance to the Chinese. According to Struys, the Formosans are of small stature, those particularly who inhabit the mountains, and their visage is broad. The women have large and full breasts, and a beard like the men; their ears naturally long, they render still more so by certain thick shells, which they were as pendants; their hair is very black, and very long, and their complexion is of different degrees yellow. These islanders, though averse to labour, are yet admirably skilled in the use of the javelin, and bow; they are also excellent swimmers; and when they run, their swiftness is incredible.

The MOGULS, and the other inhabitants of the peninsula of India, are not unlike the Europeans in shape and in features; but they differ more or less from them in colour. The Moguls are of an olive complexion; and yet in the Indian language, the word *Mogul* signifies *White*. The women are extremely delicate, and they bathe themselves very often: they are of an olive colour, as well as the men; and contrary to what is seen among the women of Europe, their legs and thighs are long, and their body is short. Tavernier says, that, after passing Lahor, and the kingdom of Cachemire, the women have naturally no hair on any part of the body, and the men have hardly any beard. According to Thevenot, the Mogul women are tolerably fruitful, though exceedingly chaste. They likewise suffer little from the pains of child-birth, and are often known to be up and abroad the day following. He adds, that in the kingdom of Decan, they are allowed to marry, the husband by his tenth, and the wife by her eighth year; and at that age they not unfrequently have children. The women who become mothers so soon, usually cease bearing, however, before they arrive at thirty; and by that period, they appear wrinkled, and marked with all the deformities of age.

The customs of the different nations of India are all very singular, if not whimsical. The Banians eat nothing which has had life in it; they are even afraid to kill the smallest reptile, however offensive to them; they throw rice and beans into their rivers as food for the fishes, and grain of different kinds upon the earth for the birds and

insects. When they meet with a hunter, or a fisher, they beg of him instantly to desist from his employment; if deaf to their entreaties, they offer him money for his gun, or nets; and when no persuasion, no offer will avail, they trouble the water, in order to frighten away the fishes, and cry with all their might, in order to put the birds and other game to flight.

In Ceylon there is a species of savages, who go by the name of *Bedas*, and who occupy a small district on the northern part of the island. These *Bedas* seem to be totally different from all the nations around them. The spot they inhabit is entirely covered with wood, amidst which they keep themselves so closely concealed, that it is with great difficulty they are discovered. Their complexion is fair, and sometimes even red, like that of Europeans. They do not speak the language of Ceylon: nor, indeed, has the language they do speak the smallest affinity to that of any of the other Indians. They have no villages, no houses, no intercourse with the rest of mankind. Their arms are the bow and the arrow, with which they destroy a number of boars, stags, and other animals: and though they never dress their meat, they yet sweeten it with honey, which they possess in great abundance.

The inhabitants of PERSIA, of Turkey, of Arabia, of Egypt, and of the whole of Barbary, may be considered as one and the same people, who, in the time of Mahomet, and of his successors, invaded immense territories, extended their dominions, and became exceedingly intermixed with the original natives of all those countries. The Persians, the Turks, and the Moors, are, to a certain degree, civilized; but the ARABIANS have, for the most part, remained in a state of independence, which implies a contempt of laws. They live like the Tartars, without order, without government, and almost without society: theft, robbery, and violence, are authorized by their chiefs; they glory in their vices; to virtue they pay not the smallest respect; and of all human conventions, those only have they admitted, which owe their existence to fanaticism, and to superstition.

They are a people highly inured to labour; and to labour they take especial care to habituate also their horses. They allow this animal to eat and drink but once in twenty-four hours, and though their horses are necessarily meagre, they yet are excellent coursers, and seem, as it were, indefatigable.

The **EGYPTIAN** women are very brown; their eyes are lively; their stature is rather low; their mode of dress is by no means agreeable; and their conversation is extremely tiresome. But though the women of Egypt are commonly rather short, yet the men are of a good height. Both, generally speaking, are of an olive colour; and the more we remove from Cairo, the more we find the people tawny, till we come to the confines of Nubia, where they are as black as the Nubians themselves.

The most inherent defects of the Egyptians are idleness and cowardice. They do nothing almost the whole day but drink coffee, smoke, sleep, remain indolent in one place, or chatter in the streets. They are highly ignorant, and are full of the most ridiculous vanity. Though they cannot deny but they have lost every thing noble they once possessed; the sciences, the exercise of arms, their history, and even their language; and that, from an illustrious and valiant nation, they have become a people dastardly enslaved; they yet scruple not to despise all other nations, and to take offence at the bare offer of carrying their children into Europe, in order to give them a knowledge of the arts and sciences.

"The women of **CIRCASSIA**," says Struys, "are exceedingly fair and beautiful. Their complexion is incomparably fine; their forehead is large and smooth; and without the aid of art, their eye-brows are so delicate, that they appear as threads of silk. Their eyes are large, soft, and yet full of animation, their mouth is small, and expressive of a smile, and their chin, what it ought to be in order to form a perfect oval. Their neck and breasts are admirably formed; their stature is tall, and the shape of their body easy; their skin is white as snow, and their hair of the most beautiful black. They wear a little cap of a black stuff over which is fastened a roller of the same colour; but what is truly ridiculous, is, that, instead of this roller, the widows wear the bladder of an ox, or a cow, inflated as much as possible, by which they disfigure themselves amazingly. In the summer-months, the inferior classes wear nothing but a shift, which is open down to the middle, and which is generally of a blue, yellow, or red colour. They are tolerably familiar with strangers, but at the same time faithful to their husbands, who are by no means inclined to be jealous of them."

The **TURKS**, who purchase a vast number of those women as slaves, are a people composed of many different

nations. From the intermixture during the crusades of the Armenians, the Georgians, and the Turcomans, with the Arabians, the Egyptians, and even the Europeans, it is hardly possible to distinguish the native inhabitants of Asia Minor, of Syria, and of the rest of Turkey. All we can observe is, that the Turkish men are generally robust, and tolerably well made; that it is even rare to find among them persons either hump-backed or lame; that the women are also beautiful, well-proportioned, and free from blemishes; that they are very fair, because they seldom stir from home; and that, when they go abroad, they are always veiled.

Before the Czar Peter I. we are told, the MUSCOVITES had not emerged from barbarism. Born in slavery, they were ignorant, brutal, cruel, without courage, and without manners. Men and women bathed promiscuously in bagnios heated to a degree intolerable to all persons but themselves; and, on quitting this warm bath, they plunged, like the Laplanders, into cold water. Their food was homely; and their favourite dishes were cucumbers, or melons, of Astracan, which, in summer, they preserved in a mixture of water, flour, and salt. From ridiculous scruples they refrained from the use of several viands, amongst which were pigeons and veal. Yet, even at this period of unrefinement, the women were skilled in the arts of colouring the skin, of plucking out the eye-brows, and of painting artificial ones. They also adorned themselves with pearls and jewels, and their garments were made of rich and valuable stuffs. From these circumstances does it not appear that the barbarism of the Muscovites was near a close, and their sovereign had less trouble in polishing them than some authors have endeavoured to insinuate? They are now a people in some degree civilized and commercial, fond of spectacles, and of other ingenious novelties.

From the regions of Europe and Asia, our attention is now to be directed to a race of people differing more from ourselves in external appearances than any that has been hitherto mentioned.

In the seventeenth or eighteenth degree of north latitude, on the African coast, we find the NEGROES of Senegal and of Nubia, some in the neighbourhood of the ocean, and others of the red sea; and after them, all the other nations of Africa, from the latitude of eighteen north to that of eighteen south, are black, the Ethiopians, or Abyssinians

excepted. It appears, then, that the portion of the globe which Nature has allotted to this race of men, contains an extent of ground, parallel to the equator, of about nine hundred leagues in breadth, and considerably more in length, especially northward of the equator. Beyond the latitude of eighteen or twenty, there are no longer any Negroes, as will appear when we come to speak of the Caffres, and of the Hottentots.

By confounding them with their neighbours the Nubians, we have been long in an error, with respect to the colour and the features of the ETHIOPIANS. Marmol says, that the Ethiopians are absolutely black, that their visage is large, and their nose flat ; and in this description the Dutch travellers agree with him. The truth, however, is, that they differ from the Nubians, both in colour and in features. The skin of the Ethiopians is brown, or olive-coloured, like that of the southern Arabians, from whom, it is probable, they derive their origin. In stature they are tall ; the features of their countenance are strongly marked ; their eyes are large and beautiful ; their nose is well-proportioned ; their lips are thin, and their teeth are white. Of the inhabitants of Nubia, on the contrary, the nose is flat, the lips are thick and prominent, and the countenance is exceedingly black. These Nubians, as well as the barbarians, their western neighbours, are a species of Negroes not unlike those of Senegal.

The Ethiopians are a people between the extremes of barbarism and of civilization. Their garments are of cotton, though those of the more opulent are of silk ; their houses are low, and of a bad construction ; their lands, too, are wretchedly neglected. These circumstances are owing to the behaviour of their nobles, who despise, mal-treat and plunder, as far as in them lies, the tradesmen and the common people. Each of these classes, however, lives separate from the other, and has its own villages or hamlets. Unprovided with salt at home, they purchase it from abroad for its weight in gold. So fond are they of raw meat, that at their feasts, the second course, which they consider as the most delicate, consists of it entirely. Though they have vines, they yet have no wine ; and their usual beverage is a sour composition made with tamarinds. They use horses for the purpose of travelling, and mules for that of carrying their merchandize. Of the arts or sciences they have little knowledge ; their language is without rules ; and their manner of writing, though their characters are more beau-

tiful than those of the Arabians, is so imperfect, that, in order to finish an epistle, they require several days. In their mode of salutation there is something exceedingly whimsical. Each takes the right hand of the other and carries it to his mouth; this done the saluter takes off the scarf of the person saluted, and fastens it round his own body; so that the latter is left half naked, few of the Ethiopians wearing any thing more than this scarf, and a pair of cotton drawers.

The first NEGROES (see plate II.) we meet with, are those who live on the south side of Senegal. These people, as well as those who occupy the different territories between Senegal and Gambia, are called *Jalofes*. They are all very black, well-proportioned, and of a size sufficiently tall. Their features are less harsh than those of the other Negroes; and some of them there are, especially among the female sex, whose features are far from irregular. With respect to beauty, they have the same ideas as ourselves; of which, as essential ingredients, they consider fine eyes, a well-made nose and mouth, and lips of a proportional smallness. With respect to the ground of the picture alone they differ from us; for with them the colour must be exceedingly black, and exceedingly glossy; their skin, however, is highly delicate and soft; and colour alone excepted, we find among them women as handsome as in any other country in the world. They are usually very gay, lively and amorous.

Father du Tertre says expressly, that, if the Negroes are for the most part flat-nosed, it is because the parents crush the noses of their children; that in the same manner they compress their lips, in order to render them thicker; and that of the few who have undergone neither of these operations, the features of the countenance are as comely, the nose is as prominent, and the lips are as delicate as those of the Europeans. It appears, however, that among the Negroes in general, thick lips, and a nose broad and flat, are gifts from nature, by which was originally introduced, and at length established, their custom of flattening the nose and thickening the lips of such as at their birth, discovered a deficiency in these ornaments.

Though the Negroes of Guinea are in general very healthy, yet they seldom attain what we term old age. In his own country, a Negro at the age of fifty is a very old man; and so early as at that of forty he discovers all the marks of being so.

The negroes in general are a remarkably innocent and inoffensive people. If properly fed, and unexposed to bad usage, they are contented, joyous, and obliging; and on their very countenance may we read the satisfaction of their soul. If hardly dealt with, on the other hand, their spirits forsake them, and they droop with sorrow. Alike impressed with a sense of the injuries, and of the favours they have received, to a cruel master they are implacable foes; to an indulgent one, servants who will exert every effort of which human nature is capable, in order to express to him their zeal and their attachment. To their children, their friends, their countrymen, they are naturally compassionate and tender; cheerfully of the little they have, do they communicate a share to those who are in necessity or in indigence, though otherwise than from that necessity, that indigence they have not, perhaps, the smallest knowledge of them. That they have excellent hearts, therefore, is evident; and in having this, they have the seed of every virtue. Their sufferings demand a tear. Are they not already sufficiently unhappy in being reduced to a state of slavery; in being obliged always to work without ever reaping the smallest fruits of their labour? To crown their wretchedness must they be abused, buffeted, treated like brutes? Humanity revolts at the idea of a conduct which nothing but the thirst of gold could ever have introduced, and of which, from that thirst, every day will still, perhaps, produce an aggravated repetition, till an enlightened legislature shall put an end to a traffic which disgraces human nature.

Mr. Kolbe, though he has given so minute a description of the HOTTENTOTS, is strongly of opinion, however, that they are Negroes. Like that of the latter, he assures us, their hair is short, black, frizzled and woolly; nor in a single instance did he ever observe it long.

Though of all the Hottentots the nose is very flat, and very broad, yet it would not be of that form, did not their mothers, considering a prominent nose as a deformity, think it a duty incumbent upon them to crush it presently after their birth. Their lips are also thick, and their upper lip is particularly so; their teeth are very white; their eye-brows are thick; their head is large; their body is meagre; their limbs are slender. They seldom live longer than forty years; and of this short duration of life, the causes doubtless are, their being so fond of filth, and residing continually in the midst of it; as also their living upon meat

which is tainted or corrupted, of which, indeed, their nourishment chiefly consists. I might dwell longer upon the description of this nasty people; but as most travellers have given very large accounts of them, to their writings I refer. One fact, however, related by Tavernier, I ought not to pass in silence. The Dutch, he says, once took a Hottentot girl, soon after her birth; and after bringing her up among themselves, she became as white as an European. From this circumstance he presumes, that all the Hottentots would be of a tolerable whiteness, were it not for their custom of perpetually begriming themselves.

Though in AMERICA we observe less variety in the human form than might be expected in so extremely extensive a continent, it cannot yet be supposed, but that in such a diversity of climates and situations, a considerable diversity of inhabitants must also be found.

In beginning our inquiries, then, we find in the most northern parts of America a species of Laplanders, similar to those of Europe, or to the Samoeids of Asia; and though, in comparison of the latter, they are few in number, yet they are diffused over a considerable extent of ground. Those who inhabit the land of Davis's Strait, are of a diminutive size, of an olive complexion, and their legs are short and thick. They are skilful fishers; they eat their fish and their meat raw; their drink consists of pure water, or of the blood of the dog-fish; they are, moreover, very strong, and generally live to a great age. Here we see the figure, the colour, and the manners of the Laplanders; and what is truly singular is, that as among the Laplanders of Europe, we meet with the Finlanders, who are white, comely, tall, and tolerably well made; so, in like manner, among the Laplanders of America, we meet with another species of men, tall, well made, tolerably white, and with features exceedingly regular.

Of a different race from the former seem to be the savages of Hudson's Bay, and northwards of the land of Labrador: they are, however, ugly, diminutive, and unshapely; their visage is almost entirely covered with hair, like the savages of the country of Yeco, northward of Japan. In summer they dwell under tents made of skins of the reindeer; in winter they live under ground, like the Laplanders and the Samoeids, and, like them, sleep together promiscuously, and without the smallest distinction. They likewise live to a great age, though they feed on nothing but raw meat and fish. The savages of Newfoundland have a

considerable resemblance to those of Davis's Strait ; they are low in stature ; they have little or no beard ; their visage is broad and flat ; their eyes are large ; they are generally rather flat-nosed ; and, upon the whole, are far from being unlike the savages of the northern continent, and of the environs of Greenland.

Besides these savages, who are scattered over the most northern parts of America, we find others more numerous, and altogether different, in Canada, and in the vast extent of land to the Assinboils (See plate 2.) These are all tolerably tall, robust, vigorous, and well made ; they have hair and eyes black, teeth very white, a complexion tawny, their beard scanty, and over the whole of their body hardly a vestige of hair ; they are hardy, indefatigable walkers, and very nimble runners. They are alike unaffected by excesses of hunger, and of repletion ; they are by nature bold and fierce, grave and sedate. So strongly, indeed, do they resemble the Oriental Tartars in the colour of their skin, the hair, and the eyes, in the scantiness of beard, and of hair, as also in disposition and in manners, that were they not separated from each other by an immense sea, we should conclude them to be descended from that nation. In point of latitude, their situation is also the same ; and this still farther proves how powerfully the climate influences not only the colour, but the figure of men.

Mr. Fabry, who travelled a prodigious way to the north-west of the Mississippi, and visited places which no European had visited before him, and of which, consequently, the savage inhabitants had not been destroyed, asserts, that that part of America is so deserted, that he often travelled an hundred, and two hundred leagues, without observing a single human face, or the smallest vestige of an habitation ; that, whenever he did meet with any habitations, they were always at immense distances from one another ; that, in each of them there were frequently no more than one family ; sometimes there were two or three families, but never above twenty persons together ; and that, between these twenty persons and twenty others, there was generally a space of a hundred leagues, at least.

To dwell long on the customs of such savage nations, would be unnecessary. It has not been always attended to by authors, that what they have given us for established customs, and for the manners of a community, were nothing more than actions peculiar to a few individuals, and often determined by circumstances, or by caprice. Some nations they tell us, eat their enemies, some burn them, and some

mutilate them ; one nation is perpetually at war ; and of another, the grand object is to live in peace ; in one country the child kills his parent, when he has lived to a certain age ; and in another, the parent eats his child. All these stories, on which travellers have with so much complacency enlarged, mean nothing more than that one savage had devoured his enemy, another had burned or mutilated him, and a third had killed or eaten his child. All these things may be known to happen in one, as well as in several savage nations ; for every nation in which there is no government, no law, no master, no habitual society, ought rather to be teemed a tumultuous assemblage of men, barbarous and independent ; of men who obey nothing but their own private passions, and who, incapable of having a common interest, are also incapable of pursuing one object, and of submitting to fixed and settled usages.

If, however, in the whole of North America, there were none but savages to be met with ; in Mexico, and in Peru, there were found nations polished, subjected to laws, governed by kings, industrious, acquainted with the arts, and not destitute of religion.

In the present state of these countries, so intermixed are the inhabitants of Mexico and New Spain, that hardly do we meet with two visages of the same colour. In the town of Mexico there are white men from Europe, Indians from the north and from the south of America, and negroes from Africa, &c. insomuch, that the colour of the people exhibits every different shade which can subsist between black and white. The real natives of the country are of a very brown olive colour, well made, and active ; and though they have little hair, even upon their eyebrows, yet upon their head, their hair is long, and very black.

In surveying the different appearances which the human form assumes in the different regions of the earth, the most striking circumstance is that of colour. This circumstance has been attributed to various causes ; but experience justifies us in affirming, that of this the principal cause is the heat of the climate. When this heat is excessive, as at Senegal and in Guinea, the inhabitants are entirely black ; when it is rather less violent, as on the eastern coasts of Africa, they are of a lighter shade ; when it begins to be somewhat more temperate, as in Barbary, in India, in Arabia, &c. they are only brown ; and, in fine, when it is altogether temperate, as in Europe and in Asia, they are white ; and the varieties which are there remarked, proceed solely from

those in the mode of living. All the Tartars, for example, are tawny, while the Europeans, who live in the same latitude, are white. Of this difference the reasons seem to be, that the former are always exposed to the air; that they have no towns, no fixed habitations; that they sleep upon the earth, and in every respect live coarsely and savagely. These circumstances alone are sufficient to render them less white than the Europeans, to whom nothing is wanting which may render life comfortable and agreeable. Why are the Chinese whiter than the Tartars, whom they resemble in all their features? It is because they live in towns, because they are civilized, because they are provided with every expedient for defending themselves from the injuries of the weather, to which the Tartars are perpetually exposed.

When cold becomes extreme, however, it produces some effects similar to those of excessive heat. The Samoeids, the Laplanders, the Greenlanders, are very tawny; and it is even asserted, as we have already observed, that among the Greenlanders, there are men as black as those of Africa. Here we see two extremes meet; violent cold, and violent heat, produce the same effect upon the skin, because these two causes act by one quality, which they possess in common. Dryness is this quality; and it is a quality of which intense cold is equally productive as intense heat, so by the former, as well as by the latter, the skin may be dried up, altered, and rendered as tawny as we find it among the Laplanders. Cold compresses, shrivels, and reduces within a narrow compass, all the productions of nature; and thus it is, that we find the Laplanders, who are perpetually exposed to all the rigours of the most piercing cold, the most diminutive of the human species.

The most temperate climate is between the degrees of forty and fifty. There we behold the human form in its greatest perfection; and there we ought to form our ideas of the real and natural colour of man. Situated under this zone, the civilized countries are, Georgia, Circassia, the Ukraine, European Turkey, Hungary, South Germany, Italy, Switzerland, France, and the North of Spain; of all which the inhabitants are the most beautiful, and the most shapely, in the world.

As the first and almost the sole cause of the colour of mankind, we ought therefore to consider the climate; and though upon the skin the effects of nourishment are trifling, when compared with those of the air and soil, yet upon the

form they are prodigious. Food which is gross, unwholesome or badly prepared, has a strong and a natural tendency to produce a degeneracy in the human species; and in all countries where the people fare wretchedly, they also look wretchedly, and are uglier and more deformed than their neighbours. Even among ourselves, the inhabitants of country places are less handsome than the inhabitants of towns; and I have often remarked, that, in one village, where poverty and distress were less prevalent than in another village of the vicinity, the people of the former were, at the same time, in person more shapely, and in visage less deformed.

The air and the soil have also great influence, not only on the form of men, but on that of animals, and of vegetables. Let us, after examining the peasants who live on hilly grounds, and those who live imbosomed in the neighbouring valleys, compare them together, and we shall find, that the former are active, nimble, well-shaped, and lively; the women commonly handsome; that on the contrary, in the latter, in proportion as the air, food and water are gross, the inhabitants are clumsy, and less active and vigorous.

From every circumstance, therefore, we may obtain a proof, that mankind are not composed of species essentially different from each other; that, on the contrary, there was originally but one individual species of men, which, after being multiplied and diffused over the whole surface of the earth, underwent divers changes, from the influence of the climate, from the difference of food, and of the mode of living, from epidemical distempers, as also from the intermixture, varied *ad infinitum*, of individuals more or less resembling each other; that, at first these alterations were less considerable, and confined to individuals; that, afterwards, from the continued action of the above causes becoming more general, more sensible, and more fixed, they formed varieties in the species; that these varieties have been, and are still, perpetuated from generation to generation, in the same manner as certain deformities, and certain maladies, pass from parents to their children; and that, in fine, as they would never have been produced but by a concurrence of external and accidental causes, as they would never have been confirmed and rendered permanent but by time, and by the continued action of these causes, so it is highly probable, that in time they would in the same manner gradually disappear, or even become different

from what they at present are, if such causes were no longer to subsist, of if they were in any material point to vary.

OF ACCIDENTAL VARIETIES IN THE HUMAN SPECIES.

Besides, those great varieties proceeding from general causes, which have just been noticed, and which serve as marks of distinction to the nations of the earth, there are others, which affect only individuals, which appear casual and often unfortunate deviations from the general standard.

The *Blafards*, or WHITE NEGROES (if this expression may be admitted), are among the first of these extraordinary deviations which attract our attention. They are found occasionally in all parts of the East Indies, at Madagascar, in Africa, at Carthage, and most parts of South America. They are a weak, imbecile class of human beings, and are in general barren. The Negresses at Carthage and Panama, more frequently than any others, are known to produce Blafards; and it is to be observed, that the climate there is more debilitating to the human frame. "Those of Darien (says a modern traveller) have so marked a resemblance to the White Negroes of Africa, that we cannot but assign them to the same origin. Their colour is dead white, like that of paper or muslin, and without the least appearance of red on any part of the surface of the body. They are born white, and their skin never darkens. In Africa their hair is white and woolly, like that of the genuine Negroes; and in Asia it is long, and as white as snow, or reddish, inclining to yellow. Their eye-brows and eye-lashes resemble the skin of the eider-duck, or rather the soft down which is about the throat of the swan. The iris is sometimes of a pale blue, and sometimes of a lively yellow, inclining to reddish. They are in general remarkably feeble, and of low stature." In plate II. the reader is presented with the figure of a white Negress of the name of Genevieve. She was born of black parents, in the island of Dominica, in the year 1759, and was 18 years of age when this drawing was made. Her father and mother were brought from the Gold Coast in Africa, and were perfectly black. Genevieve was white in every part of her body. She was about 4 feet 11 inches high, and her body was well proportioned. Every feature was completely correspondent to those of the Negroes. The lips and the mouth, however, though perfectly formed like those of other Negroes, had a singular

appearance for want of colour; they were as white as the rest of her skin, with no appearance of red. Her skin in general was of a tallow colour; when she approached the fire, however, there was a slight tinge of red appeared in her cheeks. Her head was well covered with wool of about an inch and an half in length. It was harsh, thick, and frizzled; it was white at the roots, and reddish at the extremity. The eye-brows were just marked by a light white down, and the eye-lashes were rather more apparent. Her eyes appeared of a dull blue. This white Negress endured the full light of the sun without winking or any apparent inconvenience. She was, what is called, short-sighted, but she could distinguish the smallest objects at two or three inches from her eyes. But the most singular circumstance respecting her eyes, was a continual motion, or oscillation, by which they alternately turned from and towards each other; and this motion she was not able to stop.

Her teeth were well arranged, and finely enamelled; there was no disagreeable smell about her, nor any oiliness upon the skin, as is often the case with common Negroes. Her hands were large but well formed, and were covered with wrinkles, like those of an old person. Her feet and her ankles were also wrinkled. Her parents produced only this girl white; the rest of their children were all perfect Negroes.

It has been said that these White Negroes, if united with Blacks, would produce a pied race; but however this be, it is certain that pied or spotted Negroes are not uncommon. It arises evidently from some defective organization in the skin; and we have instances even in this climate of deviations from the ordinary course of nature, not less surprising. The most singular of these was the PORCUPINE MAN. He was born in the county of Suffolk in 1710. The skin of his body was covered with excrescences like thorns, or prickles, and about the thickness of a packthread. His face, the palms of his hands, and the soles of his feet, were the only parts which were free from these singular warts. They were of a reddish brown, and had such a degree of hardness and elasticity, as to rattle when the hand was moved over the body. They were half an inch long in some parts, and were shorter in others. They did not appear till two months after his birth; but what is most extraordinary, they dropped off every winter, and were renewed in the spring. In other respects the man enjoyed a good state of health. He had six children, all of

whom like their father, were covered with these excrescences.

A very remarkable spotted child was exhibited in Paris in 1774, whose name was Anna Maria Herig : she was born at Dackstul in Lorraine, in 1770. Neither her father nor mother had any spots whatever on their skin, but the child was spotted all over the body, and even on the face, with marks some large and some small, the greater part of which were raised above the skin, like the little blisters or bladders on veal ; in some other parts they were covered with hair, like that of a deer. Both the skin and the hair were of a brown colour ; there were also spots quite destitute of hair, and the naked skin in those spots resembled tanned leather. In other respects the child was of a pleasant countenance ; had handsome eyes, but very large eye-brows. She appeared uneasy in summer from the heat ; for, besides the hair-spots in other parts of her body, her stomach and belly were covered with the same hair, of a brown colour on one side, and lighter on the other ; and her back seemed to be covered with a tunick of hair ; and her skin, which adhered to the body only in certain loops and which in reality consisted of a number of little covered tubercles very near to each other, and which appeared all her whole back to her reins ; these tubercles appeared of a different nature from the rest of her skin, and were very sensible when pinched. The lower part of her loins, and the tops of her shoulders were covered with hair more than two inches in length. Those parts of the skin which were not deformed with these spots, were remarkably white and delicate.

There have been some very extraordinary instances of a change in the colour of negroes. Frances, the Negro cook of Col. Barnet, was born in Virginia, and was of a very strong and robust constitution. Her skin was originally as black as that of any African Negro ; but about the age of 15 years, she observed that those parts of her skin which were near her nails and her fingers gradually became white. In a short time after, her mouth underwent the same change ; and from that period to her fortieth year, the white has been gradually extending over her whole body. Those parts which have changed colour are as delicate as the skin of the most beautiful European, and display very distinctly the ramifications of the red veins. The neck and the back have preserved more of their original colour than any other part ; the head, the face, the breast, the

belly, the thighs, legs, and arms are become almost entirely white. When the passions of resentment, shame, &c. are excited in this Negress, her face and her breast blush with redness. In the same manner all those parts which are exposed to the fire, become red with the action of heat. She has always enjoyed a remarkably good state of health, has never made use of any application to her skin; she has always been well-clothed, and no difference is perceptible between those parts which have been covered, and those which have been exposed.

Among these varieties of nature in the human species we may reckon Dwarfs and Giants. Deceived by some optical illusion, the ancient historians gravely mention whole nations of pigmies as existing in remote quarters of the world. The more accurate observations of the moderns, however, convince us that these accounts are entirely fabulous.

The existence, therefore, of a pigmy race of mankind, being founded in error or in fable, we can expect to find men of diminutive stature only by accident, among men of the ordinary size. Of these accidental dwarfs, every country, and almost every village can produce numerous instances. There was a time when these unfavourable children of Nature were the peculiar favourites of the great; and no prince or nobleman, thought himself completely attended, unless he had a dwarf among the number of his domestics. These poor little men were kept to be laughed at, or to raise the barbarous pleasure of their masters, by their contrasted inferiority. Even in England, as late as the time of king James the First, the court was at one time furnished with a dwarf, a giant, and a jester: these the king often took a pleasure in opposing to each other, and often fomented quarrels among them, in order to be a concealed spectator of their animosity. It was a particular entertainment of the courtiers at that time, to see little Jeffery, for so the dwarf was called, ride round the lists, expecting his antagonist; and discovering, in his actions, all the marks of contemptible resolution.

It was in the same spirit that Peter of Russia, in the year 1710, celebrated a marriage of dwarfs. This monarch, though raised by his native genius far above a barbarian, was, nevertheless, still many degrees removed from actual refinement. His pleasures, therefore, were of the vulgar kind; and this was among the number. Upon a certain day, which he had ordered to be proclaimed several

months before, he invited the whole body of his courtiers, and all the foreign ambassadors, to be present at the marriage of a pigmy man and woman. The preparations for this wedding were not only very grand, but executed in a style of barbarous ridicule. He ordered, that all the dwarf men and women, within two hundred miles, should repair to the capital; and also insisted, that they should be present at the ceremony. For this purpose, he supplied them with proper vehicles; but so contrived it, that one horse was seen carrying a dozen of them into the city at once, while the mob followed shouting, and laughing from behind. Some of them were at first unwilling to obey an order, which they knew was calculated to turn them into ridicule, and did not come; but he soon obliged them to obey; and, as a punishment, enjoined that they should wait upon the rest at dinner. The whole company of dwarfs amounted to seventy, beside the bride and bridegroom, who were richly adorned, and in the extremity of the fashion. For this company in miniature, every thing was suitably provided; a low table, small plates, little glasses, and, in short, every thing was so fitted, as if all things had been dwindled to their own standard. It was his great pleasure to see their gravity and their pride; the contention of the women for places, and the men for superiority. This point he attempted to adjust, by ordering, that the most diminutive should take the lead; but this bred disputes, for none would then consent to sit foremost. All this, however, being at last settled, dancing followed the dinner, and the ball was opened with a minuet by the bridegroom, who measured exactly three feet two inches high. In the end matters were so contrived, that this little company, who met together in gloomy pride, and unwilling to be pleased, being at last familiarized to laughter, joined in the diversion, and became, as the journalist has it, extremely sprightly and entertaining.

But the most complete history of a dwarf is preserved by M. Daubenton, in his Natural History. This dwarf, whose name was Baby, was well known, having spent the greatest part of his life at Lunenville, in the palace of Stanislaus, the titular king of Poland. He was born in the village of Plaisne, in France, in the year 1741. His father and mother were peasants, both of good constitutions, and inured to a life of husbandry and labour. Baby, when born, weighed but a pound and a quarter. We are not informed of the dimensions of his body at that time; but

we may conjecture they were very small, as he was presented on a plate to be baptized, and for a long time lay in a slipper. His mouth, although proportioned to the rest of his body, was not, at that time, large enough to take in the nipple; and he was therefore, obliged to be suckled by a she-goat that was in the house; and that served as a nurse, attending to his cries with a kind of maternal fondness. He began to articulate some words when eighteen months old; and at two years he was able to walk alone. He was then fitted with shoes that were about an inch and a half long. He was attacked with several acute disorders; but the small-pox was the only one which left any marks behind it. Until he was six years old, he ate no other food but pulse, potatoes, and bacon. His father and mother were, from their poverty, incapable of affording him any better nourishment; and his education was little better than his food, being bred up among the rustics of the place. At six years old he was about fifteen inches high; and his whole body weighed but thirteen pounds. Notwithstanding this, he was well proportioned, and handsome; his health was good, but his understanding scarcely passed the bounds of instinct. It was at that time that the king of Poland, having heard of such a curiosity, had him conveyed to Lunenville, gave him the name of Baby, and kept him in his palace.

Baby having thus quitted the hard condition of a peasant, to enjoy all the comforts and the conveniencies of life, seemed to receive no alteration from his new way of living, either in mind or person. He preserved the goodness of his constitution till about the age of sixteen, but his body seemed to increase very slowly during the whole time; and his stupidity was such, that all instructions were lost in improving his understanding. He could never be brought to have any sense of religion, nor even to shew the least signs of a reasoning faculty. They attempted to teach him dancing and music, but in vain; he never could make any thing of music; and as for dancing, although he beat time tolerably exact, yet he could never remember the figure, but while his dancing-master stood by to direct his motions. Notwithstanding, a mind thus destitute of understanding was not without its passions; anger, and jealousy harassed it at times; nor was he without desires of another nature.

At the age of sixteen Baby was twenty-nine inches high; at this he rested; but having thus arrived at his acme, the

alterations of puberty, or rather, perhaps, of old age, came fast upon him. From being very beautiful, the poor little creature now became quite deformed; his strength quite forsook him; his back-bone began to bend; his head hung forward; his legs grew weak; one of his shoulders turned awry; and his nose grew disproportionably large. With his strength, his natural spirits also forsook him; and by the time he was twenty, he was grown feeble, decrepid, and marked with the strongest impression of old age. It had been before remarked by some, that he would die of old age before he arrived at thirty; and, in fact, by the time he was twenty-two he could scarcely walk an hundred paces, being worn with the multiplicity of his years, and bent under the burthen of protracted life. In this year he died; a cold, attended with a slight fever, threw him into a kind of lethargy, which had a few momentary intervals; but he could scarcely be brought to speak. However, it is asserted, that in the last five days of his life, he shewed a clearer understanding, than in his times of best health: but at length he died, after enduring great agonies, in the twenty-second year of his age.

Opposite to this accidental diminution of the human race, is that of its extraordinary magnitude. Concerning the reality of a nation of giants, there have been many disputes among the learned. Some have affirmed the probability of such a race; and others, as warmly have denied the possibility of their existence. But it is not from any speculative reasonings, upon a subject of this kind, that information is to be obtained.

We have several accounts from mariners, that a nation of giants actually exists; and mere speculation should never induce us to doubt their veracity.

Ferdinand Magellan was the first who discovered this race of people along the coast, towards the extremity of South America. Magellan was a Portuguese, of noble extraction, who having long behaved with great bravery, under Albuquerque, the conqueror of India, he was treated with neglect by the court, upon his return. Applying, therefore, to the king of Spain, he was entrusted with the command of five ships, to subdue the Molucca islands; upon one of which he was slain. It was in his voyage thither, that he happened to winter in St. Julian's Bay, an American harbour, forty-nine degrees south of the line. In this desolate region, where nothing was seen but objects of ter-

ror, where neither trees nor verdure dressed the face of the country, they remained for some months without seeing any human creature. They had judged the country to be utterly uninhabitable; when one day they saw approaching, as if he had been dropped from the clouds, a man of enormous stature, dancing and singing, and putting dust upon his head, as they supposed in token of peace. This overture for friendship was, by Magellan's command, quickly answered by the rest of his men; and the giant approaching, testified every mark of astonishment and surprise. He was so tall, that the Spaniards only reached his waist; his face was broad, his colour brown, and painted over with a variety of tints; each cheek had the resemblance of a heart drawn upon it; his hair was approaching to whiteness; he was clothed in skins, and armed with a bow. Being treated with kindness, and dismissed with some trifling presents, he soon returned, with many more of the same stature; two of whom the mariners decoyed on ship-board: nothing could be more gentle than they were in the beginning; they considered the fetters that were preparing for them, as ornaments, and played with them, like children with their toys; but when they found for what purpose they were intended, they instantly exerted their amazing strength, and broke them in pieces with a very easy effort. This account, with a variety of other circumstances, has been confirmed by succeeding travellers: Herrera, Sebald Wert, Oliver Van Noort, and James le Maire, all correspond in affirming the fact, although they differ in many particulars of their respective descriptions. The last voyager we have had, that has seen this enormous race, is Byron.

This race of giants are described as possessed of great strength; and, no doubt, they must be very different from those accidental giants that are to be seen in different parts of Europe. Stature with these, seems rather their infirmity than their pride; and adds to their burthen, without increasing their strength. The generality, indeed, are ill-formed and unhealthy; weak in their persons, incapable of exerting what strength they are possessed of. The same defects of understanding that attended those of suppressed stature, are found in those who are thus overgrown; they are heavy, phlegmatic, stupid, and inclined to sadness. The numbers, however, are but few; and it is thus kindly ordered by Providence, that as the middle state is the best

fitted for happiness, so the middle ranks of mankind are produced in the greatest numbers.

To these varieties in the human species might be added a considerable catalogue of **MONSTERS**; but as few of these have survived the hour of their birth, and as the detail of most of them can only serve to disgust, we shall only trouble the reader with the affecting account of the most singular production of this kind that stands recorded in the History of Nature.

On the 26th of October, 1701, at Tzoni, in Hungary, two female children were born, which were united together at the loins. They lived to the age of 21 years. At seven years of age they were carried into Holland, England, Italy, Russia, and almost into every country of Europe. At the age of nine they were purchased by a pious clergyman, in order to place them in a convent at Petersburg, where they remained till the 25th of February, 1723, when they died.

One of these twins was named Helen, and the other Judith. Helen appeared first in the birth, as far as the naval, and three hours after she was completely extricated, along with Judith. Helen grew tall, and was straight. Judith was less, and a little crooked. As they were united at the loins, they could only see one another by turning their heads. There was only one anus in common to them both; but in other respects they appeared as two different women. They in general agreed well together, and loved each other affectionately. At six years of age Judith was affected with a palsy on the left side; and though afterwards she appeared cured, she always retained a strong impression of that malady, and her mind was always heavy and weak. Helen, on the contrary, was handsome and gay. She had a good understanding, and some wit. They had the small-pox and the measles at the same time; but they had other maladies or indispositions separately: for Judith was subject to a cough and a fever; Helen on the contrary enjoyed good health. When they were nearly twenty-one years of age, Judith took a fever, fell into a lethargy, and died; the unfortunate Helen was obliged to follow her lot. Three minutes before the death of Judith, she fell into an agony, and died almost at the same moment. In dissecting them, it was found, that the entrails of each were perfect, that each had even a distinct canal for the excrements; but which, nevertheless, met and united in the same anus.

CHAP. VII.

Of Quadrupeds in general—Of domestic Animals—The Horse—The Ass—The Ox—The Sheep—The Goat—The Swine—Of the wild Boar, &c.

IF we descend, by regular gradations, from man to those classes of animals which approach nearest him in their nature and their habits, we must, on every account, assign the first rank to the quadruped part of creation; since whether we direct our attention to their form and structure, or to their manners and instincts, we shall find them more correspondent to our own than those of any other order of animated beings.

The general anatomy of the monkey tribe is so analogous to that of man, that it requires some skill in physiology to make the distinction; and even those quadrupeds which least resemble us, when they erect themselves in an upright position, still preserve striking marks of their affinity.

But, if we compare their internal structure with our own, the likeness will be found still to increase, and we shall perceive many advantages they enjoy in common with us, above the lower tribes of nature. Like us, they are placed above the class of birds, by bringing forth their young alive; like us, they are placed above the class of fishes, by breathing through the lungs; like us, they are placed above the class of insects, by having red blood circulating through their veins; and lastly, like us, they are different from almost all the other classes of animated nature, being either wholly or partly covered with hair. Thus nearly are we represented in point of conformation to the class of animals immediately below us; and this shews what little reason we have to be proud of our persons alone, to the perfection of which quadrupeds make such near approaches.

Even in the passions of man; nay, in the most amiable of the passions, we find some species of this class no contemptible rivals. What can equal the attachment of the dog to its master? Even over the grave that contained his dust has this animal been known to breathe its last. But (without meaning to quote the prodigies and the heroes of this, any more than of any other class) with what fidelity does it accompany, with what constancy does it follow, with what attention does it defend, its master? What

eagerness to obtain his caresses ! What docility in obeying him ! What patience in suffering his bad humours, and his frequently unjust corrections ! What mildness, and what humility, in its endeavours to be restored to favour ! What emotion, what anxiety, what sorrow, when he is absent ! What joy when he returns !—From all these circumstances, is it possible not to distinguish friendship ? Even among ourselves, is it expressed in characters of superior energy ?

The forms and instincts of animals are adapted to their situations. However proud man may superficially suppose the Sloth, that employs whole months in climbing up a tree, or the Mole, whose eyes are too small for distinct vision, to be wretched and helpless creatures, their life is probably a life of luxury to them, and, if abridged in one pleasure, it may be doubled in those that remain.

The heads of quadrupeds are in general calculated for their manner of living.—In some it is sharp, in order to enable the animal to turn up the earth in which its food lies. In some it is long, in order to give room for the olfactory nerves, as in dogs, which hunt by the scent. In others it is short, as in the lion, to give it the greater strength, and fit it the better for combat.

The teeth are also fitted to the nature of their food. In those which live upon flesh, they are sharp, and fitted for holding and dividing ; in those which subsist on vegetable diet, they are calculated for pounding or grinding their aliment. Their legs also are equally adapted to the life they are intended to lead. The feet of some that live upon fishing are webbed and calculated for swimming. Animals of prey have their feet armed with claws, which some can sheathe and unsheathe at will.

The stomach is generally proportioned to the quality of the food. In those that live upon flesh, it is small and glandular. On the contrary, animals that live upon vegetables have the stomach very large ; and those which chew the cud have no less than four stomachs, though in Africa, where the plants are soft and nutritious, some of this class have only two.

The most obvious distinction in quadrupeds is between those which are domestic, or which man has found easy to reduce to a state of dependence on him, and to retain in it ; and the wild, or those which continue in their native savage state. Many different kinds of classification have been proposed by speculative naturalists ; but in an order

of beings which contains so small a number of distinct species, scientific arrangements serve rather to confuse than to instruct.

The number of species, in the quadruped class, which may be said to have distinct marks or characters, is usually stated at 200 ; though late authors have enumerated 280, and even some minute philosophers have subdivided them into upwards of 400.

The Horse. The noblest conquest which was ever made by man, is that of this spirited and haughty animal, which shares with him the fatigues of war, and the glory of the combat. Equally intrepid as his master, the horse sees the danger, and braves it ; inspired at the clash of arms, he loves it, he seeks it, and is animated with the same ardour. He feels pleasure also in the chase, in tournaments, in the course ; he is all fire, but equally tractable as courageous, does not give way to his impetuosity, and knows how to check his inclinations ; he not only submits to the arm which guides him, but even seems to consult the desires of his rider ; and always obedient to the impressions which he receives from him, presses on, moves, gently, or stops, and only acts as his rider pleases. The horse is a creature which renounces his being, to exist only by the will of another, which he knows how to anticipate, and even express, and execute by the promptitude and exactness of his movements ; he feels as much as we desire, does only what we wish, giving himself up without reserve, and refuses nothing, makes use of all his strength, exerts himself beyond it, and even dies the better to obey us.

Such is the horse, whose natural qualities art has improved. His education commences with the loss of his liberty, and by constraint it is finished. The slavery or servitude of these creatures is universal, and so ancient that we rarely see them in their natural state : they are never wholly free from all their bands, not even at the time of rest ; and if they are sometimes suffered to range at liberty in the fields, they always bear about them tokens of servitude, and frequently the cruel marks of servitude and of pain : the mouth is deformed by the wrinkles occasioned by the bit, the flanks scarred with wounds, inflicted by the spur, the hoofs are pierced by nails, the attitude of the body constrained, from the subsisting impression of habitual shackles, from which they would be delivered in vain, as they would not be the more at liberty for it. Even those

whose slavery is the most gentle, who are only fed and broken for luxury and magnificence, and whose golden chains serve less to decorate them, than to satisfy the vanity of their master, are still more dishonoured by the elegance of their trappings, by the tresses of their manes, by the gold and silk with which they are covered, than by the iron shoes on their feet.

Nature is more delightful than art, and in an animated being, the freedom of its movements makes nature beautiful; observe the horses in Spanish America, which live wild; their gait, their running, or their leaping, seem neither constrained nor regular. Proud of their independence, they fly the presence of man, and disdain his care; they seek and find for themselves proper nourishment; they wander about in liberty in immense meads, where they feed on the fresh productions of an eternal spring: destitute of any fixed habitation, without any other shelter than a mild sky, they breathe a purer air than those which are confined in vaulted palaces. These wild horses are also much stronger, much swifter, and more nervous than the greater part of domestic horses; they have, what nature has bestowed upon them, strength and nobleness; the others only what art can give, beauty and cunning.

The natural disposition of these animals is not ferocious, they are only high spirited and wild; and though superior in strength to the greatest part of animals, they yet never attack them; and if they are attacked by others, either disdain them or trample them under their feet. They go also in bodies, and unite themselves into troops, merely for the pleasure of being together, for they are not fearful of, but have an attachment to each other. As herbs and vegetables are sufficient for their nourishment, they have quite enough to satisfy their appetite; and as they have no relish for the flesh of animals, they never make war with them, nor with each other; they never quarrel about their food, they have no occasion to ravish the prey of another, the ordinary source of contentions and quarrels among carnivorous animals. They live in peace because their appetite is simple and moderate; and, as they have enough there is no room for envy.

As all parts of Europe are at present peopled, and almost equally inhabited, wild horses are no longer found there; and those which we see in America, were originally European tame horses, which have multiplied in the vast deserts of that country. The astonishment and fear

which the inhabitants of Mexico and Peru expressed at the sight of horses and their riders, convinced the Spaniards that this animal was entirely unknown in these countries ; and therefore carried thither a great number as well for service, and their particular utility, as to propagate the breed. M. de la Salle, in 1685, saw in the northern parts of America, near the bay of St. Louis, whole troops of these wild horses feeding in the pastures, which were so fierce that no one dared to approach them. The author of the History of the Adventures of the Buccaneers, says, that in the island of St. Domingo, horses may sometimes be seen in troops of upwards of five hundred, all running together, and that as soon as they see a man, they will all stop ; that one of them will approach to a certain distance, snort, take flight, and then all the rest will follow him. To catch them, they make use of nooses made of ropes, which they spread and hang in places which they know they frequent : but if they are caught by the neck they strangle themselves, unless the hunter comes time enough to their assistance, who instantly secures them by the body and legs, and fastens them to trees, where they are left for two days without either food or drink. This experiment is sufficient to begin to make them tractable, and in time they become as much so as if they had never been wild ; and even, if by chance they ever regain their liberty, they never become so again, but know their masters, and suffer them to catch them again without trouble.

The manners of these animals almost wholly depend on their education. From time immemorial it has been the custom to separate the colts from their mothers : mares are suffered to suckle them five, six, or seven months ; for experience has taught us, that those colts which are suckled ten or eleven months, are not of equal value with those which are weaned sooner, though they are generally fuller of flesh. After six or seven months sucking, they are weaned ; that they may take more solid nourishment than milk ; bran is then given them twice a day, and a little hay, of which the quantity is increased in proportion as they advance in age, and they are kept in the stable as long as they seem to retain any desire to return to the mare ; but when this desire ceases, they are suffered to go out in fine weather, and led to pasture ; but care must be taken not to suffer them to go out to pasture fasting ; they must have bran, and be made to drink an hour before they are suffered to graze, and are never to be exposed to great cold or rain : in this

manner they spend their first winter : in the May following, they are not only permitted to graze every day, but are suffered to lie in the fields all the summer, and even to the end of October, only observing not to let them eat the after-grass ; for if they accustom themselves much to it, they will grow disgusted with hay, which ought, however, to be their principal food, during the second winter, together with bran mixed with barley, or oats wetted. They are managed in this manner, letting them graze in the daytime during winter, and in the night also during the summer, till they are four years old, when they are taken from the pastures, and fed on hay. This change in his food requires some precaution ; for the first eight days, the colt should have nothing but straw, and it is proper to administer some vermifuge drinks, as worms may have been generated from indigestion, and green food.

Great attention must be paid in weaning young colts, to put them into a proper stable, not too hot, for fear of making them too delicate and sensible to the impressions of the air. They should frequently have fresh litter, and be kept very clean, by rubbing them down with a wisp of straw. But they should not be tied up and curried till they are two years and a half, or three years old : this currying gives them great pain, their skin being as yet too delicate to bear it, and they would fall away instead of growing fat from it ; care must also be taken that the rack and manger are not too high, the necessity of raising their heads too high in order to reach their food, may possibly give a habit of carrying it in this fashion, which would give them an aukward appearance.

At the age of three years, or three years and a half, the rider should begin to break them and make them tractable ; they should at first have a light easy saddle, and ought to wear it two or three hours every day, and they should be accustomed to have a snaffle bit in their mouths, and to lift up their feet, on which they should sometimes receive rather smart strokes, and if designed for coach or draught horses, should wear harness and a bridle. At first a curb should not be used, they should be held by a cavesson or leather strap, and be made to trot, on even ground, without a rider, and with only the saddle or harness on the body ; and when the saddle horse turns easily, and willingly follows the person who holds the leather strap, the rough rider should mount him and dismount again in the same place, without making him move, till he is four years old,

because, before that age, the weight of a man overloads him, but at four years he should be made to walk or trot, a little way at a time, with the rider on his back. When a coach horse is accustomed to the harness, he should be paired with a horse that is thoroughly broken, putting on him a bridle, with a strap passed through it, till he begins to be used to the draught ; after this the coachman must teach him to back, having the assistance of a man before, who must push him gently back, and even give him some blows to make him do it : all this should be done before young horses have changed their food, for when once they are what is called corn-fed, that is, when they feed on grain and hay, as they are more vigorous, it is remarked also that they are less tractable, and more difficult to break.

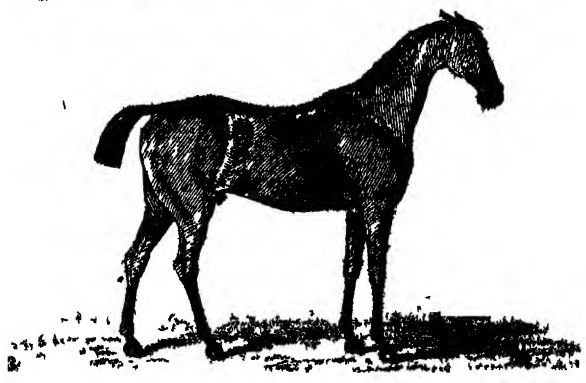
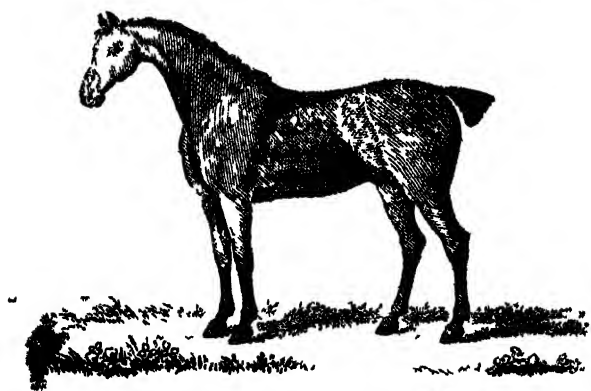
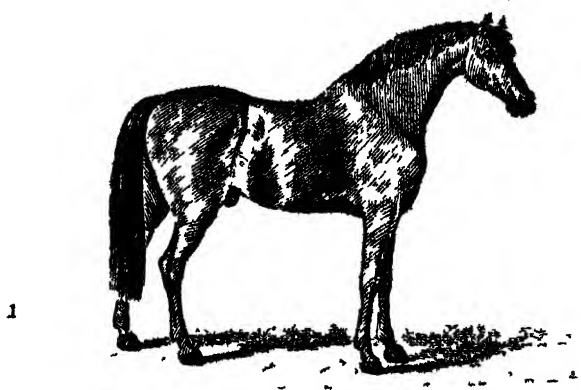
The bit and the spur are two means made use of to bring them into order. The mouth does not appear formed by nature to receive any other impressions than that of taste and appetite ; there is, however, so great a sensibility in the mouth of a horse, that in preference to the eyes and ears, we address ourselves to it, to make him understand our pleasure ; the smallest motion or pressure of the bit is sufficient to inform and determine the animal ; and this organ of sense has no other fault than its perfection. Its too great sensibility must be managed, for if it is abused, the mouth of the horse is spoilt, and rendered insensible to the impression of the bit ; the senses of sight and hearing are not subject to such a change, and could not be dulled in this manner, but, it has been found convenient to govern horses by these organs, and it is generally true, that signs given by the sense of feeling have more effect on animals in general than those conveyed to the eyes or ears ; besides, the situation of horses with relation to those who mount or conduct them, make their eyes almost useless for this purpose, because they see only strait forwards, so that they could only perceive the signs made to them when they turned their heads round ; and although they are frequently conducted and animated by the ear, yet, in fact, if they are well broken, the smallest pressure of the thighs, or most trifling motion of the bit, is sufficient to direct them ; the spur is even useless, or at least it is only made use of to force them to violent motions ; and as through the folly of the rider, it often happens that in giving the spur, he checks the bridle, the horse finding himself excited on one side, and kept in on the other, only prances and capers without stirring out of its place.

By means of the bridle we teach horses to hold up their heads, and place them in a proper manner, and the smallest sign or movement of the rider is sufficient to make the horse shew all his different paces; the most natural is perhaps the trot, but ambling and galloping are more pleasant for the rider, and these are the two paces we particularly endeavour to improve.

Though walking is the slowest of all their paces, an horse should, notwithstanding, step quick, and neither take too long nor too short steps; his carriage should be easy; this ease depends much on the liberty of his shoulders, and is known by the manner in which he carries his head in walking; if he keeps it high and steady, he is generally vigorous, quick, and free in his motions. When the motion of the shoulders is not free, the leg does not rise enough, and the horse is apt to stumble, and strike his foot against the inequalities of the ground; and when the shoulders are still more confined in their action, and the motion of the legs appears free, the horse is soon fatigued, stumbles, and becomes useless. A horse should raise his shoulders, and his lower haunches in walking; he should also support his leg, and raise it high enough, but if he keeps it up too long, or lets it fall too slowly, he loses all the advantage of his suppleness, becomes heavy, and fit for nothing but to match with another, and for shew.

It is not sufficient that his walk should be easy, his steps must be also equal and uniform both behind and before, for if his buttocks have a swinging motion whilst he keeps up his shoulders, the rider is much jolted, which is very uneasy to him: the same thing happens when the horse extends his hind leg too much, and rests it almost in the same place in which he rested his fore foot. Horses with short bodies are subject to this fault: those which cross their legs, or strike them against each other, are not sure footed; and those whose bodies are long, are the most easy for the rider, because he is at a greater distance from the two centres of motion, the shoulders and haunches, and is therefore less sensible of the motion and jolting.

The usual method of walking among quadrupeds, is to lift up at the same time one of the fore and one of the hind legs; whilst the right fore leg is in motion, the left hind leg follows and advances at the same time, and this step being made, the left fore leg conjointly with the right hind leg in its turn, and so on. As their bodies are supported



1. *Shetland Horse*... 2. *English Hunter*... 3. *Paint Horse*

upon four points, which form a long square, the easiest manner of moving for them, is to change two of them at once in a diagonal line, in such a manner, that the centre of gravity of the body of the animal may move but little, and rest always in the direction of the two points which are not in motion ; in the three natural paces of the horse, the walk, the trot, and the gallop, this rule of motion is always observed, but with some difference. In the walk, there are four times in the movement ; if the right fore leg moves first, the left hind leg follows the moment after, then the left fore leg moves forward in turn, to be followed the instant after by the right hind leg ; thus the right fore foot rests on the ground first, the left hind foot next, then the left fore foot rests, and lastly, the right hind foot, which makes a movement of four times. In the trot there are but two times in the movement ; if the right fore leg goes off first, the left hind leg moves at the same time, and without any interval between the motion of the one, and the motion of the other ; also the left fore leg moves at the same time with the right hind one.

In the gallop there is usually three times ; but as in this movement there is a kind of leaping, the interior parts of the horse do not move of themselves, but are driven away by the strength of the haunches and the hinder parts : thus, of the two fore legs, the right ought to advance more forward than the left ; the left ought before hand to rest on the ground to serve as a point of rest for the sudden jerk which he takes : thus it is the left hind foot that makes the first time of the movement, and which rests on the ground first ; then the right hind leg is lifted up conjointly with the left fore leg, and rest on the ground together : at length, the right fore leg (which is raised an instant after the left fore leg, and right hind one) rests on the ground last, which makes the third time : thus, in this movement of the gallop, there are three times and two intervals ; and in the first of these intervals, when the movement is made with haste, there is an instant when the four legs are in the air at the same time, and when the four shoes of the horse may be seen at once. When the horse has the haunches and the houghs supple, and moves them with quickness and agility, the movement of the gallop is more perfect, and the cadence is made in four times : he then rests the left hind foot which shews the first time ; then the right hind foot falls to the ground and shews the second time ; the left fore foot falls a moment after, shewing the third

time; and at length the right fore foot, which rests last, shews the fourth time.

Horses usually gallop on the right foot, in the same manner as they carry the fore right leg in walking and trotting; they also throw up dirt in galloping with the right fore leg, which is more advanced than the left; and also the right hind leg which follows immediately the right fore one, is more advanced than the left hind leg, and that the whole time that the horse continues to gallop: whence it results, that the left leg which supports all the weight, and which forces forwards the others, is more tired; for this reason it would be right to exercise horses in galloping alternately on the left foot, as well as on the right; and they would consequently bear much longer this violent motion.

In walking, the legs of the horse are lifted up only a small height, and the feet almost touch the ground; in trotting they are raised higher, and the feet are entirely free from the ground; in galloping the legs are lifted up still higher, and the feet seem to rebound from the earth. The walk to be good should be quick, easy, light, and sure; the trot should be firm, quick, and equally sustained; the hind foot ought to follow well the fore foot; the horse in this pace should carry his head high, and his back strait; for, if the haunches rise and fall alternately at each trot he takes, if the crupper moves up and down, and the horse rocks himself, he trots ill through weakness; if he throws out wildly his fore legs, it is another fault: the fore legs should tread in a line with the hind ones, which should always efface their tracks. When one of the hind legs is thrown forwards, if the fore leg of the same side remain in its place too long, the motion becomes more uneasy and difficult from this resistance; and it is for this reason that the interval between the two times of the trot should be short; but, be it ever so short, this resistance is sufficient to make this pace more uneasy than walking and galloping, because in walking the motion is more easy, gentle, and the resistance less; and in galloping there is scarcely any horizontal resistance, which is the only one inconvenient for the rider.

Walking, trotting, and galloping, are the most usual natural paces; but some horses have another natural pace, called the amble, which is very different from the three others, and at the first glance of the eye appears contrary to the laws of mechanics, and extremely fatiguing to the

animal, though the quickness of motion is not so great as in galloping, or trotting hard. In this pace the foot of the horse grazes the ground still more than in walking, and each step is much longer. But the most remarkable circumstance is, that the two legs on the same side set off at the same time to make a step, and afterwards the two other legs move at the same time to make another, so that each side of the body alternately is without support, and there is no equilibrium maintained between the one and the other; it is therefore only from his almost grazing the earth, and the quick alternate motion, that he can support himself in this pace. There is in the amble, as well as the trot, but two times in the motion, and all the difference is, that in the trot the two legs which go together are opposite, in a diagonal line: instead of which, in the amble, the two legs on the same side go together: this pace is very easy for the rider, as it has not the jolting of the trot, which is occasioned from the resistance the fore leg meets with when the hind leg rises; because, in the amble, the fore leg rises at the same time with the hind leg on the same side, instead of which, in trotting the fore leg on the same side, rests and assists the impulse during the whole time that the hind leg is in motion.

The horse, of all animals, is that which, with great stature, has the most complete proportion and elegance in every part of his body; and compared with every other animal he appears superior in these respects. The great length of the jaws is the principal cause of the difference between the heads of quadrupeds and of the human species: it is, also, the most ignoble mark of all; yet, though the jaws of the horse are very long, he has not, like the ass, an air of imbecility, or of stupidity, like the ox. The regularity of the proportions of his head, on the contrary, gives him an air of sprightliness, which is well supplied by the beauty of his chest. The horse seems desirous of raising himself above his state of a quadruped, by holding up his head, and in this noble attitude he looks man in the face; his eyes are lively and large, his ears well made, and of a just proportion, without being short, like those of the bull, or too long like those of the ass; his mane suits well his head, ornaments his neck, and gives him an air of strength and haughtiness; his long bushy tail covers and terminates advantageously the extremities of his body, far different from the short tails of the stag, the elephant, &c. and the naked tails of the ass, the camel, the rhinoceros,

&c. The tail of the horse is formed of long, thick hair, which seems to come from the rump, because the stump from which it grows is very short; he cannot raise his tail like the lion, but it suits him better hanging down, as he can move it sideways; it is very useful to him to drive away the flies which incommode him: for though his skin is very hard, and is every where furnished with a close thick coat, it is, notwithstanding, extremely sensible.

The head of a well proportioned horse should be lean and small, without being too long; the ears at a moderate distance, small, straight, immoveable, narrow, thin, and well-placed on the top of the head; the forehead narrow, and a little convex; the hollows filled up, the eye-lids thin, the eyes clear, lively, full of fire, rather large, and projecting from the head; the pupil large, the nether jaw thin, the nose a little aquiline, the nostrils large and open, the partition of the nose, and the lips thin, the mouth of a moderate width, the withers raised and sloping, the shoulders thin, flat, and not confined, the back equal, even, and insensibly arched lengthways, and raised on each side of the spine, which should appear indented; the flanks full and short, the rump round and fleshy, the haunches well covered with hair, the stump of the tail thick and firm, the fore legs and thighs thick and fleshy, the knee round before, the houghs large and rounded, the sinew loose, the joint next the foot small, the fetlock not thickly covered with hair, the pastern large, and of a middling length, the coronet rather raised, the hoof black, smooth, shining, and high, the quarters round, the heels wide and moderately raised, the frog small and thin, and the sole thick and hollow.

But there are few horses in which this assemblage of perfection is to be found; the eyes are subject to many complaints, which are sometimes difficult to be known. In a healthy eye we ought to see through the cornea two or three spots of the colour of soot, above the pupil: to see these spots the cornea must be clear, clean, and transparent; if it appears double, or of a bad colour, the eye is not good: a small, long, and straight pupil, encompassed with a white circle, is also a bad sign; and when it is of a blueish-green colour, the eye is certainly bad, and the sight dull.

It is very easy to judge of the natural and actual state of the animal by the motion of his ears; when he walks, he should project forwards the points of his ears; a jaded

horse carries his ears low ; those which are spirited and mischievous, alternately carry one of their ears forwards and one backwards ; they all carry their ears on that side from which they hear any noise, and when any one strikes them on the back, or on the rump, they turn their ears back. Horses which have the eyes deep sunk in the head, or one smaller than the other, have usually a bad sight ; those which have the mouth dry, are not of so healthy a temperament as those which have the mouth moist, and make the bridle frothy. A saddle horse ought to have the shoulders flat, moveable, and not very fleshy ; the draft horse, on the contrary, should have them flat, round, and brawny : if, notwithstanding, the shoulders of a saddle horse are too thin, and the bones shew themselves through the skin, it is a defect which shews the shoulders are not free, and consequently the horse cannot bear fatigue. Another fault of a saddle horse is, to have the chest project too forward, and the fore legs drawn too much back, because he is apt to rest on the hand in galloping, and even to stumble and fall : the length of the legs should be proportionable to the height of the horse ; when the fore legs are too long he is not sure footed, if they are too short, he is too heavy in the hand : it is a remark that mares are more liable than horses to be short-legged, and that horses in general have the legs thicker than mares or geldings.

One of the most important things to be known is, the age of the horse : it is from the teeth that we obtain the most certain knowledge of their age ; the horse has forty ; twenty-four grinders, four eye teeth, and twelve incisive teeth : mares have no eye teeth, or if they have them they are very short : the grinders are not instrumental to the knowledge of their age, we form our judgment from the front and eye teeth. The twelve front teeth begin to shew themselves fifteen days after the birth of the foal ; these first teeth are round, short, not strong, and drop out at different times, in order to make room for others : at two years and a half the four front middle teeth drop out the first, two at top and two at bottom ; a year after four others fall out, one on each side of those which are already replaced ; at about four years and a half, four others drop out, always on the side of those which have been replaced, these four last milk teeth are replaced by four others, which do not grow near so fast as those which replaced the first eight ; and these four last teeth which are called the wedges, and which replace the four last milk teeth, are those

by which we know the age of an horse; these are easily known, since they are the third as well at top as at bottom, beginning to count from the middle to the extremity of the jaw; these teeth are hallow and have a black mark in their concavity; at four years and a half, or five years old, they scarcely project beyond the gums, and the hollow is plainly seen; at six years and a half it begins to fill up, the mark also begins to diminish and grow narrower, and so continues till seven years and a half or eight years, when the hollow is entirely filled up and the black mark effaced: after the animal has attained eight years, as these teeth do not give further information of the age, we generally judge by the eye teeth or tusks; these four teeth are placed at the side of those which I have just now been speaking of; the eye teeth, as well as the grinders, are not preceded by others which fall out, those of the inferior jaw usually come out first at three years and a half, and the two of the upper jaw at four years, and till they are six years old they are very sharp; at ten years old the upper ones appear already blunt, worn and long, because they are bare, the gum wearing away with age, and the more they are worn away the more aged the horse is: from ten till thirteen or fourteen years, there is hardly any indication of the age, but then some hairs on the eye-brows begin to grow white; but this indication is equivocal, since it has been remarked that horses engendered from old stallions and old mares have the hair white on the eye-brows at ten years old. There are also horses whose teeth are so hard that they do not wear, and upon which the black mark subsists, and is never effaced; and others which have the mark in the mouth as long as they live. We may also know, though with less precision, the age of a horse by the ridges of the palate, which are effaced in proportion to his age.

It has been remarked, that studs situated in dry and light countries produce good-tempered, swift, and vigorous horses, with nervous legs and hard hoofs; while on the other hand, those which are bred in damp places, and in fat pasturage, have generally the head large and heavy, the legs thick, the hoofs soft, and the feet flat. This difference arises from the climate and food, which may be easily understood; but, what is more difficult to be comprehended, and what is still more essential than any thing that has been said, is, the necessity of always crossing or mixing the breed, if we would prevent their degenerating.

Mares usually go with foal eleven months and some days; they will breed commonly to the age of fourteen or fifteen years, and the more vigorous longer than eighteen years.

The duration of the life of horses, is like that of every other species of animals, in proportion to the time of their growth. Man, who is above fourteen years in growing, lives six or seven times as long, that is to say, ninety or a hundred years. The horse, who attains his full growth in four years, lives six or seven times as long, that is to say, twenty-five or thirty years. There are so few examples to contradict this rule, that we should not even regard them as exceptions from which we may draw any precedents; and as robust horses are at their entire growth in less time than delicate ones, they also live less time, and at fifteen years of age are old.

The Arabian horses are the handsomest known in Europe, they are larger and plumper than those of Barbary, and equally well-shaped, but as they are not often brought into this country, riding-masters are not able to give an exact account of their perfections and defects.

The horses of Barbary are more common; they are frequently negligent in their paces, and must be often reminded: they are very swift and strong, very light, and very fit for hunting. These horses seem the most proper to breed from; it is only to be wished that they were of larger stature, as they seldom exceed four feet eight inches high.

The Turkish horses are not so well-proportioned as those of Barbary: they will, however, travel a great way, and are long winded: this is not surprising, if we do but consider, that in warm countries, the bones of animals are harder than in cold climates; and it is for this reason, that they have more strength in the legs.

The Spanish horses hold the second rank after those of Barbary; those of a handsome breed are plump, well-coated, and low of stature; they also use much motion in their carriage, and have great suppleness, spirit and pride; their hair is usually black, or of a bay chestnut colour, though there are some of all colours, and it is but seldom that they have white legs and noses. The Spaniards, who have an aversion to these marks, never breed from horses that have them, chusing only a star in the forehead.

The handsomest English horses have in their conformation great resemblance to those of Arabia and Barbary, from which, in fact, they are bred; they are frequently five feet

high, and above; they are of all colours, and have all kinds of marks; they are generally strong, vigorous, bold, capable of great fatigue, and excellent for hunting and coursing.

The horses of Italy were formerly much handsomer than they are at present, because the breed for some time has been neglected, notwithstanding there are still some handsome Neapolitan horses, especially draught horses; but, in general, they have the head large, and the chest thick; they are also untractable. These defects, however, are compensated by their noble form, their stateliness, and the beauty of their motions.

The Danish horses are so handsome in their form, and so beautiful in their coats, that they are preferred to all others for putting into carriages; they are of all colours, and even of some singular ones, as pied; and horses spotted like tigers are found no where but in Denmark.

In Germany we meet with very handsome horses; but they are generally heavy and short-breathed. The Hussars and Hungarians split their nostrils, with a view, they say, of giving them more breath, and also to hinder their neighing in battle. The Flemish horses are greatly inferior to those of Holland: they have almost all large heads, flat feet, and are subject to humours in the eyes; and these two last are essential defects in coach-horses.

According to Marmol, the Arabian horses are descended from the wild horses in the desarts of Arabia, of which, in ancient times, large studs were formed, which have multiplied so much, that all Asia and Africa are full of them: they are so swift, that some will outstrip the very ostriches in their course. The Arabians of the Desert, and the people of Lybia, breed a great number of these horses for hunting, but neither use them in travelling nor in their wars; they send them to pasture whilst there is grass for them; and when that fails they feed them only with dates and camel's milk, which make them nervous, nimble, and lean. They lay snares for the wild horses, and eat the flesh of the young ones, which they affirm is very delicate food. These wild horses are smaller than the tame ones, and are commonly ash-coloured, though there are also some white ones, and the mane and the hair of the tail is short and frizzled.

Let an Arabian be ever so poor, he has horses. They usually mount the mares, experience having taught them that they bear fatigue, hunger, and thirst, better than horses; they are also less vicious. They use them so much

to be together, that they will remain so in great numbers for days together, left to themselves, without doing the least harm to each other. The Turks, on the contrary, do not approve of mares; and the Arabians sell them the horses which they do not keep for stallions. They have long preserved, with great care, the breed of their horses; they know their generations, alliances, and all their genealogy, and distinguish the breeds by different names. The lowest price for a mare of the first class, is from one hundred, to two or three hundred pounds sterling. As the Arabians have only a tent for their house, this tent serves them also for a stable. The mare, colt, husband, wife, and children, lie promiscuously together; and the little children will lie on the body and neck of the mare and colt, without these animals incommoding or doing them the least injury. These mares are so accustomed to live in this familiarity, that they will suffer any kind of play. The Arabians treat them kindly, talk and reason with them, and take great care of them, always let them walk, and never use the spur without necessity; whence, as soon as they feel their flank tickled with the stirrup-iron, they set out immediately with incredible swiftness, and leap hedges and ditches, with as much agility as so many does; and if their rider happens to fall, they are so well broken, that they will stop short even in the most rapid gallop. All Arabian horses are of a middling size, very easy in their manner, and rather thin than fat; they are dressed morning and evening regularly, with so much care, that not the smallest spot is left in their skins; their legs are also washed, and their mane and tail are let grow long, and seldom combed, to avoid breaking the hairs. They have nothing given them to eat all day, and seldom are allowed to drink above two or three times; at sunset, a bag is fastened round their heads, in which is about half a bushel of very clean barley. These horses, therefore, eat only during the night; and the bag is not taken from them till the next morning, when all is eaten up; and in the month of March, when the grass is tolerably high, they are turned out to pasture. As soon as the spring is past, they are taken again from pasture, and have neither grass nor oats all the rest of the year, and straw but seldom, barley being their only food. The mane of the colts is cut as soon as they are a year or eighteen months old, in order to make it grow thick and long. They mount them at two years old, or two years and a half at farthest; till this age they put neither saddle nor bridle on

them; and every day, from morning till night, all the Arabian horses stand saddled at the door of the tent.

The breed of these horses is dispersed in Barbary, among the Moors, and even among the Negroes of the river Gambia and Senegal; the lords of the country have some which are of uncommon beauty. Instead of barley or oats, they give them maize reduced to flour, which they mix with milk, when they are inclined to fatten them; and in this hot climate they seldom let them drink.

The Tartars live with their horses nearly in the same manner as the Arabians do. When they are about seven or eight months old, the young children mount them, and make them walk and gallop a little way by turns; they thus break them by degrees, and oblige them to undergo long fastings; but they never mount them for racing or hunting till they are six or seven years old, and then make them support incredible fatigue, such as travelling two or three days together without stopping, passing four or five without any other food than a handful of grass every eight hours, and also insure them to go twenty-four without drinking. These horses, which appear, and which are in reality, so robust in their own country, become enfeebled, and are soon good for nothing, when transported to China or the Indies; but they succeed better in Persia and Turkey. In Lesser Tartary they have also a breed of small horses, which are in such estimation, that they are not allowed to sell them to foreigners. These horses have all the good and bad qualities of those of Great Tartary, which shews how much the same manners, and the same education, give the same disposition to these animals. There are also in Circassia, and in Mingrelia, many horses which are even handsomer than those of Tartary; there are also found some handsome horses in the Ukraine, Walachia, Poland and Sweden; but we have no particular account of their qualities and defects.

When the horse is impassioned with love, desire, or appetite, he shews his teeth, and seems to laugh; he shews them also when he is angry, and would bite; he sometimes puts out his tongue to lick, but less frequently than the ox, who licks much more than the horse, and who, notwithstanding, is less sensible to caresses.

The horse also remembers ill treatment much longer, and is sooner rebuffed than the ox; his natural spirit and courage are such, that, when he finds more is expected from him than he is able to perform, he grows angry, and will

not endeavour; instead of which, the ox, who is slow and idle, exerts himself, and is more easily tired.

The horse sleeps much less than man; for when he is in health, he does not rest more than two or three hours together; he then gets up to eat; and when he has been too much fatigued, he lies down a second time, after having eaten; but, on the whole, he does not sleep more than three or four hours in the twenty-four. There are even some horses who never lie down, but sleep standing. It has also been remarked, that geldings sleep oftener and longer than horses.

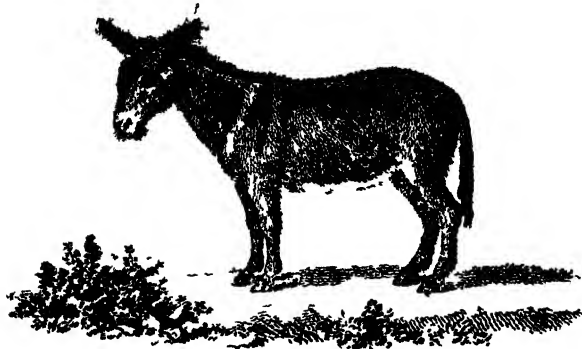
Quadrupeds do not all drink in the same manner, though they are all equally obliged to seek with the head for the liquor, which they cannot get any other way, excepting the monkey, and some others that have hands, and consequently drink like men, when a vase or glass is given them which they can hold; for they carry it to their mouths, inclining the head, throwing down the liquor, and swallowing it by the simple motion of deglutition. Man usually drinks in the same manner, because it is the most convenient. Most quadrupeds also choose that mode which is most agreeable to them, and constantly follow it. The dog, whose mouth is very large, and the tongue long and thin, drinks lapping; that is, by licking the liquor, and forming with the tongue a kind of cup or scoop, which fills each time with a tolerable quantity of liquor; and this mode he prefers to that of wetting the nose. The horse, on the contrary, whose mouth is small, and whose tongue is too short and thick to scoop it up, and who always drinks with more avidity than he eats, dips the mouth and nose quickly and deeply into the water, which he swallows largely by the simple motion of deglutition; but this forces him to drink without fetching his breath; whilst the dog breathes at his ease while he is drinking. Horses therefore should be suffered to take several draughts, especially after running, when respiration is short and quick. They should not be suffered to drink the water too cold, because that, independently of the cholic, which cold water frequently occasions, it sometimes happens also, from the necessity they are in of dipping the nose into the water, that they catch cold, which often lays the foundation of a disorder called the glanders, the most formidable of all to that species of animal; for it is known, that the seat of the glanders is in the pituitary membrane, and that it is consequently a real cold, which causes an inflammation in this

membrane ; and travellers who give us a detail of the maladies of horses in warm climates, as in Arabia, Persia, and Barbary, do not say that the glanders are so frequent there as in cold climates. It is from this that the conjecture arises, that this malady is occasioned by the coldness of the water, because these animals are obliged to dip and keep the nose and nostrils a considerable time under water, which would be prevented by never giving it to them cold, and by always wiping the nostrils after they have drank. Asses, who fear the cold more than horses, and who resemble them more strongly in the interior structure, are, notwithstanding, not so subject to the glanders ; which may possibly happen from their drinking in a different manner from horses ; for, instead of dipping the mouth and nose deeply into the water, they scarcely touch it with their lips.

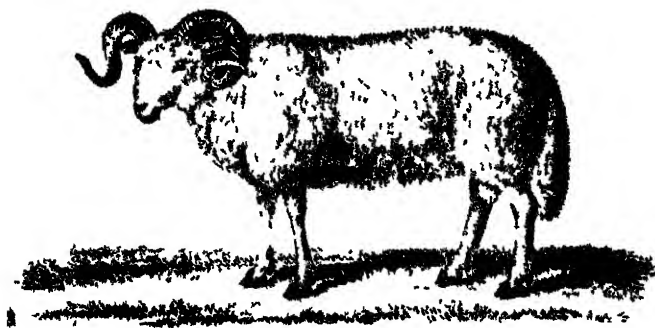
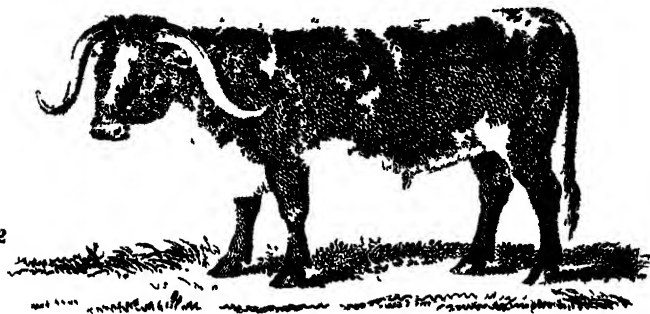
I shall not speak of the other diseases of horses ; it would extend this Natural History too much to join to the history of an animal that of its disorders ; nevertheless, I cannot leave the history of the horse, without regretting that the health of this useful animal should have been hitherto abandoned to the care, and too frequently absurd practice of ignorant people. The branch of physic which the ancients called Veterinarian, is at present scarcely known but by name. Were some physician to direct his views this way, and make this study his principal object, he would soon find it answer his purpose, both with respect to reputation and profit. Instead of degrading himself, he would render his name illustrious ; and this branch of physic would not be so conjectural and difficult as the other. All causes being more simple in animals than in man, the diseases ought also to be less complicated, and consequently more easily to be guessed at, and treated with more success, without mentioning the entire liberty he would have of making experiments and finding out new remedies, and the ability of arriving without fear or reproach at a great extent of knowledge of this kind, from which, by analogy, might also be drawn inferences useful to the art of curing mankind.

THE ASS. If we consider this animal with some degree of attention, he appears only to be a horse degenerated. The perfect similitude in the conformation of the internal parts, and the great resemblance of the body, legs, feet, and the entire skeleton, is a sufficient foundation for this

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1. Goat 2. Sheep

opinion; we may also attribute these slight differences which are found between these two animals, to the influence of the climate, food, and the fortuitous succession of many generations of small wild horses, half degenerated, which, by little and little, have still continued degenerating, and have at last produced a new and fixed species; or rather, a succession of individuals alike, all vitiated in the same manner, sufficiently differing from a horse, to be looked upon as another species. What appears to favour this notion is, that as horses vary much more than asses in the colour of their skin, they are consequently more anciently domestic, since all domestic animals vary much more in their colour than wild ones of the same species; that the greater number of wild horses, of which travellers speak, are small in their size, and have, like asses, the coat grey, and the tail naked and frizzled at the end; and, that there are wild horses, and even domestic ones, which have a black stripe on the back, and other marks, which nearly resemble both wild and domestic asses.

Again, if we consider the difference of the temperament, disposition and manners; in a word, the organism of these two animals, and above all, the impossibility of mixing the breed to make one common species, or even an intermediate species which may be renewed, it appears a better-founded opinion, that these animals are of a species equally ancient, and originally as essentially different as they are at present; as the ass differs materially from the horse, in the smallness of the size, largeness of the head, length of the ears, hardness of the skin, nakedness of the tail, the form of the rump, and also in the voice, the appetite, manner of drinking, &c. Do the horse and the ass, then, come originally from the same stock? are they of the same family, or not? and have they not always been different animals?

Although we cannot demonstrate that the production of a species, by degeneration, is a thing impossible in nature, yet the number of probabilities to the contrary is so great, that even philosophically, we can no longer doubt of it; for if some species have been produced by the degeneration of others, if the species of the ass comes from the species of the horse, this can only have happened successively; and by degrees there would have been, between the horse and the ass, a great number of intermediate animals, the first of which would have differed but slightly in its nature from the horse, and the latter would have approached by degrees to that of the ass; and why do we not see the representatives,

the descendents of these intermediate species? why do only the two extremes remain?

The ass is then an ass, and not a horse degenerated; the ass has a naked tail; he is neither a stranger, an intruder, nor a bastard; he has, like all other animals, his family, his species, and his rank; his blood is pure; and although his nobility is less illustrious, yet it is equally good, equally ancient with that of the horse. Why, then, have we so much contempt for this animal; so good, so patient, so steady, so useful? do men carry their contempt even to animals, those which serve them so well, and at so small an expence? we bestow education on the horse, take care of him instruct him, and exercise him, whilst the ass is abandoned to the care of the lowest servant, or the tricks of children; so that, instead of improving, he must lose by his education; and if there were not a fund of good qualities, he would certainly lose them by the manner in which he is treated. He is the may-game of the rusticks, who beat him with staffs, overload him, and make him work beyond his strength. We do not consider, that the ass would be in himself, and with respect to us, the most beautiful, the best-formed, and most distinguished of animals, if there were no horse in the world; he is the second, instead of being the first; and it is from that only, that he appears to be of no value: the comparison degrades him; we look at him, and give our opinions, not from himself, but comparatively with the horse: we forget that he is an ass, that he has all the good qualities of his nature, all the gifts attached to his species; and at the same time, we only think of the figure and qualities of the horse, which are wanting in him, and which he ought not to have.

He is naturally as humble, patient, and quiet, as the horse is proud, ardent, and impetuous; he suffers with constancy, and perhaps with courage, chastisement and blows; he is moderate both as to the quantity and quality of his food; he is contented with the hardest and most disagreeable herbs, which the horse, and other animals, will leave with disdain; he is very delicate with respect to his water, for he will drink none but the clearest, and from rivulets which he is acquainted with; he drinks as moderately as he eats, and does not put his nose in the water (through fear, as some say, of the shadow of his ears): as care is not taken to curry-comb him, he frequently rolls himself on the grass, thistles, and in the dust: and, without regarding his load, he lays himself down to roll about as often as he

can, and by this seems to reproach his master, for the little care he takes of him; for he does not paddle about in the mud and in the water; he even fears to wet his feet, and will turn out of his road to avoid the mud; his legs are also drier and cleaner than the horse; he is susceptible of education, and some have been seen sufficiently disciplined to be made a shew of.

In their earliest youth, they are sprightly, and even handsome; they are light and genteel; but, either from age or bad treatment, they soon lose it, and become slow, indocile and headstrong. Pliny assures us, that, when they separate the mother from the young one, she will go through fire to recover it. The ass is also strongly attached to his master, notwithstanding he is usually ill-treated; he will smell him afar off, and can distinguish him from all other men; he also knows the places where he has lived, and the ways which he has frequented: his eyes are good, and his smell acute; his ears are excellent, which has also contributed to his being numbered among timid animals, which it is pretended have all the hearing extremely delicate, and the ears long; when he is overloaded, he shews it by lowering his head and bending down his ears; when he is greatly abused, he opens his mouth, and draws back his lips in a most disagreeable manner, which gives him an air of derision and scorn; if his eyes are covered over, he remains motionless; and when he is laid down on his side, and his head is fixed in such a manner that one eye rests on the ground, and that the other is covered with a piece of wood or stick, he will remain in this situation without any motion or endeavour to get up: he walks, trots, and gallops like the horse; but all his motions are smaller, and much slower; notwithstanding he can run with tolerable swiftness, he can gallop but a little way, and only for a small space of time; and whatever pace he uses, if he is hard pressed, he is soon fatigued.

The horse neighs, and the ass brays, which he does by a long, disagreeable and discordant cry. The she-ass has the voice clearer and shriller; those that are gelded, bray very low; and, though they seem to make the same efforts, and the same motions of the throat, yet their cry cannot be heard far off.

Of all the animals covered with hair, the ass is least subject to vermin; he has never any lice, which apparently proceeds from the hardness and dryness of the skin, which is certainly harder than in the greatest part of other qua-

drupeds; and it is for the same reason, that he is much less sensible than the horse, to the whip, and the sting of the flies.

At two years and a half old, the first middle incisive teeth fall out, and afterwards the other incisive at the side of the first fall also, and are renewed at the same time and in the same order as those of the horse; the age of the ass is also known by his teeth; the third incisive on each side ascertains it, as in the horse.

The ass is three or four years in growing, and lives twenty-five or thirty years. They sleep less than the horse, and do not lie down to sleep unless when quite tired.

There are among asses different races, as among horses; but they are much less known, because they have not been taken the same care of, or followed with the same attention; but we cannot doubt that they came all originally from warm climates. Aristotle assures us, that there were none in his time in Scythia, nor in the other neighbouring countries of Scythia, nor even in Gaul, which, he says, is a cold climate; and he adds, that a cold climate either prevents them from procreating their species, or causes them to degenerate; and that this last circumstance is the reason that they are small and weak in Illyria, Thrace and Epirus. They appear to have come originally from Arabia, and to have passed from Arabia into Egypt, from Egypt into Greece, from Greece into Italy, from Italy into France, and afterwards into Germany, England, and lastly into Sweden, &c. for they are, in fact, weak and small in proportion to the coldness of the climate.

The Latins, after the Greeks, have called the wild ass, angra; which animal must not be confounded, as some naturalists and many travellers have done, with the zebra; of which we shall give a separate history, because the zebra is of a different species from the ass. The angra, or wild ass, is not striped like the zebra, and is not near so elegant in figure. Wild asses are found in some of the islands of the Archipelago, and particularly in that of Cerigo; there are also many in the Desarts of Lybia and Numidia; they are grey, and run so fast, that the horses of Barbary only can beat them in hunting. When they see a man, they give a loud cry, turn themselves about, and stop, and do not attempt to fly till they find he comes near them; they are taken in snares made with ropes, and go in troops both to pasturage and to drink; their flesh is also eaten. There were also, in the time of Marmol, wild asses in the island of Sardinia, but less than those of Africa, and Pietro della



Valle says, he has seen a wild ass at Bassora, whose figure differed in no respect from a domestic one; he was only of a lighter colour, and had, from the head to the tail, a stripe of white; he was also much livelier, and lighter in hunting, than asses usually are.

Neither asses nor horses were originally found in America, though the climate, and especially of that part called North America, is as good for them as any other: those which the Spaniards have transported from Europe, and which they have left in the West Indies, and on the Continent, have greatly multiplied; and in some parts wild asses are found in troops, and are taken in snares like wild horses.

The ass with the mare produces large mules, and the horse with the she-ass produces small mules, differing from the first in many respects. We shall finish the natural history of the ass with that of its properties, and the uses to which the animal may be applied.

As wild asses are unknown in these climates, we cannot in reality say whether the flesh is good to eat; but it is certain that the flesh of the domestic ass is extremely bad, and harder than that of the horse. The milk of the ass, on the contrary, is an approved and specific remedy for certain complaints, and its use was known from the Greeks to us: that it may be good in its kind, we should choose a young healthy she-ass, full of flesh, which has lately foaled, and which has not since been with the male: care must be taken to feed her well with hay, wheat, and grass, with particular care not to let the milk cool, and not even to expose it to the air, which will spoil it in a little time.

The skin of the ass is used for different purposes, such as to make drums, shoes, &c. and thick parchment for pocket-books, which is slightly varnished over: it is also of asses skin that the Orientals make the sagri, which we call shagreen.

The ass is, perhaps with respect to himself, the animal which can carry the greatest weight; and as it costs but little to feed him, and he scarcely requires any care, he is of great use in the country, at the mill, &c. he also serves to ride on, as all his paces are gentle, and he stumbles less than the horse: he is frequently put to the plough in countries where the earth is light, and his dung is an excellent manure to enrich hard moist lands.

The Ox. After man, those animals which live on flesh only, are the greatest destroyers: they are at the same time both the enemies of nature and the rivals of man. It is only by an attention always new, and by cares premeditated and followed, that these flocks, these birds, &c. can be sheltered from the fury of the birds of prey, and the carnivorous wolf, fox, weazel, &c. and it is only by a continual war that he can preserve his grain, fruits, all his subsistence, and even his clothing, against the voracity of the rats, moths, mites, &c. Insects are among those creatures which do more harm than good in the world; on the contrary, the ox, the sheep, and those other animals which feed on grass, are the best, the most useful, and the most valuable for man; since they not only nourish him, but consume and cost him least: the ox, above all the rest, is the most excellent in this respect, for he gives as much to the earth as he takes from it, and even enriches the ground on which he lives; instead of which, the horse, and the greatest part of other animals, in a few years impoverish the best pasture-land.

That the ox is not so proper as the horse, the ass, the camel, &c. for carrying burthens, the form of his back and loins, is a demonstration; but the thickness of his neck, and the broadness of his shoulders sufficiently indicate that he is proper for drawing, and carrying the yoke; it is also, in this manner that he draws with the most advantage, and it is singular, that this custom is not general.

Throughout some provinces they oblige him to draw with his horns, for which the only reason they give is, that when harness is fixed to his horns, he is managed with more ease: his head is very strong, and he draws very well in this manner, but with much less advantage than when he draws by the shoulders. He seems to be made on purpose for the plough; the size of his body, the slowness of his motions, the shortness of his legs, and even his tranquillity and patience when he labours, seem to concur in rendering him proper for the cultivation of the fields, and more capable than any other of overcoming the constant resistance that the earth opposes to his efforts.

In those species of animals, which man has formed into flocks, and where the multiplication is the principal object, the female is more necessary, more useful than the male; the produce of the cow is a benefit which grows,

and which is renewed every instant, the flesh of the calf is healthy and delicate; the milk is the food of children; butter relishes the greatest part of our victuals, and cheese is the common food of the country-people; how many poor families are, at this time, reduced to live on their cow! These same men who every day, and from morning to night, groan with anguish, exhausted with continual labour, gain nothing from the earth but black bread, and are obliged to give to others the flour, the substance of their grain; it is through them, and not for them, that the harvests are abundant; these same men who breed and multiply cattle, who take care of and are constantly occupied with them, dare not enjoy the fruits of their labour, the flesh of the beasts they are forbidden to eat, reduced as they are by the necessity of their condition, that is to say, by the brutality of other men, to live like horses, on barley and oats, or on common herbs, and sour milk.

At eighteen months old, the cow is arrived at puberty, and the bull when he arrives at two years; but though they can engender at this age, it is better to stay till they are three years old before they are suffered to copulate: the strength of these animals is greatest from three years old till nine; after this, neither cows nor bulls are fit for any thing but to fatten for the slaughter, as at two years of age they are almost at their full growth: the length of their lives is about fourteen years; and they seldom live longer than fifteen.

The dumbest and most idle animals are not those which sleep the soundest, or the longest. The ox sleeps, but his sleep is short, and not very sound; for he awakes at the least noise: he usually lies on his left side, and that kidney is always larger and fatter than the kidney on the right side.

Oxen, like other domestic animals, differ in colour; but red appears the most common, and the redder they are, the more they are esteemed. It is said, that oxen of a bay colour last longest; that those of a brown colour are sooner fatigued, and shorter lived; that the grey, brindled, and white are not proper for work, and are only fit to be fatted for slaughter; but whatever colour the coat of the ox is of, it should be shining, thick, and soft to the touch; for if it is rough and uneven, we have reason to think that the animal is not well, or at least, that he is not of a strong constitution.

The ox should only be worked from three years old to ten; and it is proper to take him then from the plough, in order to fatten and sell him, as the flesh will be better than if he be kept longer. The age of this animal is known by his teeth and horns. The first front teeth fall out when he is ten months old, and are replaced by others which are larger and not so white: at sixteen months those on each side of the middle teeth drop out, and are replaced by others; and at three years old, all the incisive teeth are renewed: they are then all long, white, and even; and, in proportion as the ox advances in years, they decay, and become unequal and black. The horns fall off at three years, and these are replaced by other horns, which, like the second teeth, fall off no more; only those of the ox and the cow grow larger and longer than those of the bull; the growth of these second horns is not uniform. The first year, that is to say, the fourth year of the age of the ox, two little pointed horns sprout, which are even, and terminate at the head by a kind of knob; the following year this knob grows from the head, pushed out by a cylinder of horn, which forms and terminates also by another knob, and so on; for as long as the animal lives, the horns grow: these knobs become annular knots, which are easily to be distinguished in the horns, and by which also the age may be easily known, by reckoning three years for the first knob next the point of the horn, and one year more for each of the intervals between the other knobs.

The horse eats night and day, slowly, but almost continually; the ox, on the contrary, eats quick, and takes in a short time all the food which he requires; after which he ceases eating, and lies down to ruminate. This difference arises from the different conformation of the stomachs of these animals. The ox, of whose stomachs the two first form but one bag of a vast capacity, can in both of them, without inconvenience, at the same time receive grass, which it afterwards ruminates and digests at leisure. The horse, whose stomach is small, and can receive but a small quantity of grass, is filled successively in proportion as he digests it, and it passes into the intestines, where is performed the principal decomposition of the food.

Chewing the cud is but a vomiting without straining, occasioned by the re-action of the first stomach on the food which it contains. The ox fills the two first sto-

machs, the paunch, and the bag, which is but a portion of the paunch, as much as he can. This membrane acts with force on the grass which it contains; it is chewed but a little and its quantity is greatly increased by fermentation. Were the food liquid, this force of contraction would occasion it to pass by the third stomach, which only communicates by the other by a narrow conveyance, and cannot admit such dry food, or, at least, can only admit the moister parts. The food must therefore necessarily pass up again into the œsophagus, the orifice of which is larger than the orifice of the conduit, and the animal again chews and macerates it, and moistens it afresh with its saliva; he reduces it to a paste, liquid enough for it to go into this conduit, which passes into the third stomach, where it is again macerated before it goes into the fourth; and it is in the last stomach that the decomposition of the hay is finished, which is reduced to a perfect mucilage.

What chiefly confirms the truth of this explication, is, that as long as the animals suck, and are fed with milk and other liquid aliments, they do not chew the cud; and that they chew the cud much more in winter, when they are fed with dry food, than in summer, when they eat tender grass.

Good milk is neither too thick, nor too thin; its consistence should be such, that when we take a drop, it should preserve its roundness without running, and in colour it should be of a beautiful white: that which is inclinable to blue or yellow is not good; its taste should be sweet, without any bitterness or sourness: it is best during the month of May, and during the summer; and milk is never perfectly good but when the cow is of a proper age, and in good health. The milk of young heifers is too thick, that of old cows during the winter is also too thick. The milk of cows which are hot, is not good, any more than that of a cow which is near her time, or which has lately calved. In the third and fourth stomach of the calf which sucks, there are clots of curdled milk; these clots of milk dried in the air, serve to make rennet, and the longer it is kept, the better it is, and it requires but a small quantity to make a large quantity of cheese.

Bulls, cows, and oxen, are very apt to lick themselves, but mostly when they are quiet and at rest; and as it is thought that it prevents their fattening, it is usual to rub all the parts of their bodies which they can touch with their dung. When this precaution is not taken, they raise up

the hair of their coats, with their tongues, which are very rough, and they swallow this hair in great quantities. As this substance cannot digest, it remains in the stomach, and forms round, smooth balls, which are sometimes of so considerable a size, that they incommode them, and prevent their digestion, by remaining in the stomach. These knobs in time get covered with a brown crust, which is somewhat hard; it is, notwithstanding, only a thick mucilage, which, by rubbing and co-action, becomes hard and shining: it is never found any where but in the paunch, and if any of the hair gets into the other stomachs, it does not remain any more than in the bowels, but seems to pass with the aliment.

Animals which have incisive teeth, such as the horse and the ass, in both jaws, bite short grass more easily than those which want incisive teeth in the superior jaw; and if the sheep and the goat bite the closest, it is because they are small, and their lips are thin. But the ox, whose lips are thick, can only bite long grass; and it is for this reason that they do no harm to the pasture on which they live, as they can only bite off the tops of the young grass; they do not stir the roots, and for this reason scarcely hurt the growth; instead of which, the sheep and the goat bite so close, that they destroy the stalk and spoil the root. Besides, the horse chooses the most delicate grass, and leaves the largest to grow, the stalks of which are hard; instead of this, the ox bites these thick stalks, and by little and little destroys the coarse grass; so that at the end of some years, the field in which the horse has lived becomes a very bad one, whilst that on which the ox has browsed, becomes fine pasture.

THE SHEEP. We can no longer doubt, that animals which are actually domestic, were formerly wild: those whose history has already been given, afford a sufficient proof of it; and there are still wild horses, wild asses, and wild bulls. But man, who has conquered so many millions of individuals, can he boast of having conquered an entire species? As they were all created without his participation, may he not also believe that they all have had orders to grow without his help? If we consider, nevertheless, the weakness and stupidity of the sheep, and at the same time reflect, that this animal, without defence, cannot find safety in flight; that he has for his enemies all devouring animals, which seem to seek him in preference

to any other, and to devour him by choice; that formerly this species produced but few; that each individual lived but a short time; we shall be tempted to think, that from the beginning, sheep were confided to the care of man; that they had occasion for his protection to subsist, and of his care to multiply; since it is a fact, that there are no wild sheep in the deserts; that in all places where man does not rule, the lion, the tiger, and the wolf reign by force, and by cruelty; that these animals of blood and carnage, all live long, and multiply much more than sheep: and in short, that if we were now to abandon the flocks which we have rendered so numerous, they would soon be destroyed before our eyes, and the species would be entirely annihilated by the voraciousness of its numberless enemies.

The sheep is, indeed, absolutely without resource, and without defence. The ram has but feeble arms; his courage is nothing but a petulance useless to himself, inconvenient to others, and which is destroyed by castration. The wether sheep are still more timorous than ewes; it is through fear that they gather so often in troops; the smallest noise, to which they are unaccustomed, is sufficient to make them fly, and get close together. This fear is attended with the greatest stupidity; for they know not how to fly the danger, nor do they even seem to feel the inconvenience of their situation; they continue wherever they are, either in rain or snow; and to oblige them to change their situation, they must have a chief, who is intrusted to walk first, and whom they will follow, step by step. This chief will remain with the rest of the flock, without motion, in the same place, if he be not driven from it by the shepherd, or the dog which guards them, who, in fact, watches for their safety, defends, directs, and separates them, assembles them together, and communicates to them motions not their own. Goats, which in many things resemble sheep, have much more understanding.

But this animal, so cowardly in itself, so wanting in sentiment, and interior qualities, is to man the most valuable of all animals, and the most useful, both for his present and future support. Of itself it supplies our greatest necessities. It furnishes us both with food and clothing. Without reckoning the particular advantages we have from the milk, the skin, and even the bowels, the bones, and the dung of this animal seem to evince that nature has given it nothing but what turns out useful to man.

These animals, whose understanding are so simple, are also of a very weak constitution; for they cannot walk long; travelling weakens and exhausts them; and when they run they pant, and are soon out of breath. The great heat of the sun is as disagreeable to them, as too much moisture, cold or snow. They are subject to many disorders, the greatest part of which are contagious; superabundance of fat sometimes kills them, and always prevents them from having young ones. They suffer a great deal in having young, have frequent abortions, and require more care than any other domestic animal.

At one year old, sheep lose the two front teeth of the inferior jaw; and almost every one knows that they have no incisive teeth in the superior jaw; at eighteen months old, the two neighbouring teeth of the two first that fell, fall also; and, at three years old, they are all replaced; they are then even, and tolerably white; but in proportion as the animal becomes older, they become uneven and black. The age of the ram is also known by his horns, which shew themselves in the first year, and frequently from the birth; they grow every year a ring, which is a mark round, and continue growing till death. Most commonly, the sheep have no horns; but they have bony prominences on their heads, in the same part where the horns of the rams grow; there are, notwithstanding, some sheep which have two, and even four horns. These sheep are like the others; their horns are five or six inches long, but less turned than those of the ram; and when there are four horns, the two exterior ones are shorter than the two others.

Sheep carry their young five months, and drop them at the beginning of the sixth; they usually produce but one lamb, and sometimes two; in warm climates they may produce twice a year, but in cold climates they produce but once a year.

The sheep has great plenty of milk for five or six months. This milk is tolerable food for children, and for poor people in the country; and they make good cheese with it, especially when it is mixed with cow's milk.

In dry soils, and in high grounds, where wild thyme and other odoriferous herbs abound, the flesh of the sheep is of a much better quality than when it is fed in low plain and humid valleys, unless these plains are sandy and near the sea; because then all the herbs imbibe a saltiness, and the flesh of mutton is no where so good as in these salt meadows; the sheep's milk is also more abundant, and of a better flavour,

as nothing is more pleasing to the taste of these animals than salt, nothing is more salutary for them, when it is given to them in moderation; and in some places they put into the sheep-pen a bag of salt, or a salt tone, which they will all lick by turns.

Nothing contributes more to fatten sheep, than to give them water in great quantity; and nothing prevents this advantage so much as the heat of the sun.

We frequently find worms in the livers of animals; and in the *Journal des Savans*, there is a description of worms found in the livers of sheep and oxen, as also in the German *Ephemerides*. One would think that these singular worms were only found in the livers of animals which chew the cud; but Mr. Daubenton has found some which exactly resemble them, in the liver of the ass; and, it is probable, that they may be found in the livers of other animals. It has also been said, that butterflies have been found in the livers of sheep.

The operation of sheep-sheering is performed once a year. In France it is performed in the month of May, after the sheep have been well washed, in order to make the wool as clean as possible. In April it would be too cold; and if they were to wait till the months of June and July, there would not be time enough for the wool to grow during the summer, to preserve them from the cold in the winter. The wool of ewes is usually better, and in greater abundance, than that of wethers; that on the neck, and the top of the back, is the best; that on the thighs, the belly, the tail, the throat, &c. is not so good; and that taken from beasts which are sick or dead is the worst; that which is white, is preferable to grey, brown, or black, because in dying it will take any colour. For the quality, that which is smooth is better than that which is frizzled; it is also said, that sheep whose wool is frizzled, are not so healthy as others. Another considerable advantage may be made of sheep, which is, by letting them be on ground we wish to improve. The dung, the urine, and the heat of the bodies of these animals, will, in a little time, enrich the most exhausted, cold, and infertile ground. A hundred sheep, in one summer, will enrich eight acres of land for six years.

The ancients have said, that all animals which chew the cud, have suet: but this is only true of the sheep and the goat; and that of the goat is more abundant, whiter, drier, firmer, and of a better quality than any other. Grease dif-

fers from suet, by being always soft ; instead of which, the fat gets harder as it gets colder ; and it is mostly about the loins that this suet is amassed in the greatest quantities, and the left loin has always a larger quantity than the right. Sheep have no other fat about them but suet ; and this matter is so predominant in their habit, that all the extremities of the body are edged with it ; even the blood contains a considerable quantity.

The wool of Italy, Spain, and England, is finer than the wool in France.

Those animals with large, long tails, which are so common in Africa and Asia, and to which travellers have given the name of Barbary sheep, appear to be of a different species from our sheep, as well as the lamb of America.*

THE GOAT. The species of animals are all separated by such an interval, that there seems between them only the necessary space to draw a line of separation. The ass might almost replace the horse ; and, if the species of sheep were to fail, that of the goat might supply the loss. The goat, like the sheep, furnishes milk, and even in greater abundance ; she also has suet in abundance ; her hair, though rougher than wool, serves, however, to make very good stuffs ; and her skin is worth more than the skin of the sheep. The flesh of the young goat also nearly resembles that of the lamb. These auxiliary species are wilder and more robust than the principal species. The ass and the goat do not require so much care as the horse and the sheep ; for they every where find food to support them, and browse equally on plants of all kinds, even coarse herbs, and bushes with thorns on them. They are less affected with the intemperance of the climate, they can do better without the help of man ; and the less dependence they have on us, the more they seem to belong to nature.

Although the goat is a distinct species, and perhaps more distant from that of the sheep, than the species of the ass is from that of the horse, yet the goat will willingly couple with the sheep, as the ass with the mare, and are sometimes prolific ; but they have never introduced any intermediate species between the goat and the sheep. These two species are distinct, remaining constantly separated, and always at the same distance from each other, and have never been

* See Chapter xvii.

changed by this mixture, or produced any new stock, or new breed of intermediate animals; for they have, at most, only produced different individuals, which has no influence on the unity of each primitive species, and which, on the contrary, confirms the reality of their different characteristics.

The goat has naturally more understanding, and can shift better for herself than the sheep; she comes voluntarily, and is easily familiarized; she is sensible of caresses, and capable of attachment; she is also stronger, lighter, more agile, and less timid than the sheep; she is lively, capricious, and lascivious.

Goats are fond of straying in solitary places, are fond of climbing up steep places, sleeping on the tops of rocks, and on the brink of precipices.

The inconstancy of this animal's nature is shewn by the irregularity of her actions; she walks, stops short, runs, jumps, advances, retreats, shews, then hides herself, or flies, and this all from caprice, or without any other determinate cause than her whimsical vivacity: and all the suppleness of the organs, all the nerves of the body, are scarcely sufficient for the petulance and rapidity of these motions, which are all natural to her.

That these animals are naturally fond of mankind, and that in uninhabited places they do not become wild, the following anecdote serves to confirm. In 1698, an English vessel having put into harbour at the island of Bonavista, two negroes presented themselves on board, and offered the English as many goats as they chose to carry away. On the captain manifesting a degree of surprise at this offer, the negroes observed there were but twelve persons in all the island; that the goats multiplied so fast, that they became troublesome; and that, far from having any trouble in taking them, they followed them with a kind of obstinacy, like domestic animals.

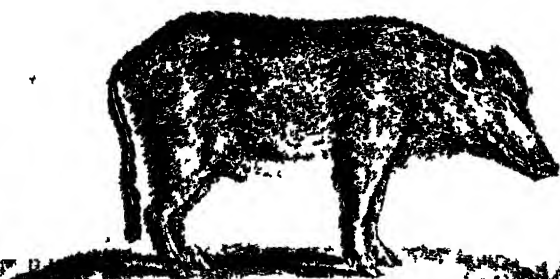
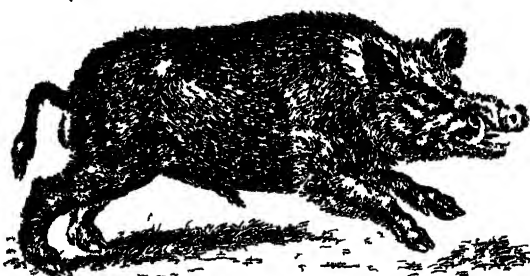
Goats go five months with young, and bring forth at the beginning of the sixth month; they suckle the young ones for about a month or five weeks; so that it may be reckoned about six-and-twenty weeks from the time of their coupling till the time that the young kid begins to eat. The goat generally produces one kid, sometimes two, very rarely three, and never more than four; and she brings forth young, from a year or eighteen months, to seven years. The knobs in the horns, and their teeth ascertain their age. The number of teeth is not always the same in female goats; but they have usually fewer than the male goat,

which has also the hair rougher, and the beard and the horns longer. These animals, like oxen and sheep, have four stomachs, and chew the cud. This species is more diffused than the sheep; and goats like ours, are found in several parts of the world, only in Guinea, and other warm countries, they are smaller; but in Muscovy, and other cold climates, they are larger. The GOATS of ANGORA and of Syria, have ears hanging down, but are of the same species with ours; they mix and produce together, even in our climate; the males have horns almost as long as the common goat; but the circumference and directions are very different; they are extended horizontally on each side of the head, and form spirals, somewhat like a worm. The horns of the female are short, and first turn round backwards, then bend down, and turn round before, so much that they end near the eyes; and in some their circumference and direction vary. The male and female goat of Angora, which I have seen, are such as I have described; and these goats, like all the animals of Syria, have the hair very long and thick, and so fine, that stuffs have been made of it, almost as handsome and glossy as our silks. It is, in fact, what is commonly termed *mohair*.

THE SWINE. I shall treat of the swine, the hog of Siam, and the wild boar, at the same time, because they form all three but one and the same species; one is wild, the other two are domestic.

Aristotle first divided quadrupeds into beasts with the hoof entire, those with cloven feet, and the species which have claws; and he allows that the hog is of an ambiguous nature; but the only reason he gives, is, that in Illyria swine are found which have hoofs, and in some other parts a species which have claws. This animal is also a kind of exception to the two general rules of nature, viz. that the larger animals are, the fewer young they produce at a birth; and that of all animals, those which have claws are the most prolific. The hog, though in its make greatly above the middling size, produces more than any such animal, or, indeed, than any other quadruped.

To the singularities we have already related, we shall add another, which is, that the fat of the hog is different from that of almost all other quadruped animals, not only in its consistence and quality, but also in its position in the body of the animal. The fat of man, and of animals which have no tallow, such as the dog, the horse, &c. is mixed



Wild Boar - 2. Domestic Pig - 3. Pig of India

equally with the flesh; the suet in the ram, the goat, the stag, &c. is found only in the extremities of the flesh; but the fat of the hog is neither mixed with the flesh, nor collected at the extremities of it; it covers it all over, and forms a thick, distinct, and continued bed or layer, between the flesh and the skin. The hog has this in common with the whale, and other cetaceous animals, the fat of which is only a kind of lard, nearly of the same consistence, but more oily than that of the hog. This lard in cetaceous animals also forms beneath the skin a bed of many inches in thickness, which envelopes the flesh.

There are only the hog, and two or three other species of animals, which have defensive or canine teeth very long: they differ from the other teeth, by coming out at the front, and growing during their whole lives. In the elephant and sea-cow, they are cylindrical, and some feet in length; in the wild-boar and male hog, they are partly bent in form of a circle; and I have seen them from nine to ten inches in length. They are not very deep in the socket, and have also, like those of the elephant, a cavity at the superior extremity; but the elephant and sea-cow have only these defensive teeth in the superior jaw, and even want canine teeth in the inferior jaw; instead of which, the male hog and wild boar have them in both jaws, and those of the inferior are the most useful to the animal: these are also the most dangerous; for it is with these lower tusks the wild boar wounds.

Of all quadrupeds, the hog appears the most rough and unpolished. His voraciousness apparently depends on the continual necessity which he has to fill the vast capaciousness of his stomach. It is the roughness of the hair, the hardness of the skin, and the thickness of the fat, which render these animals so insensible to blows. Mice have been known to lodge in their backs, and eat their fat and their skin, without their seeming sensible of it. Their other senses are good; and the huntsmen know that wild boars both see, hear, and smell, at a great distance; since, in order to surprise them, they wait in silence during the night, and place themselves under the wind, to prevent the boars perceiving their smell, of which they are sensible at a great distance, and which always immediately makes them change their road.

This imperfection in the senses of the taste and touch, is still more augmented by a distemper which is called the meazles, and which renders them almost absolutely insensible. This disorder proceeds in general from the coarseness of their

food; for the wild boar, which usually lives on corn, fruits, acorns, and roots, is not subject to this distemper, any more than the young pig whilst it sucks. This is only to be prevented by keeping the domestic hog in a clean stable, and giving him plenty of wholesome food: by this means his flesh will become excellent to the taste, and the lard firm and brittle, if, as I have seen practised, he is kept for a fortnight or three weeks before he is killed, in a clean stable, without litter, giving him no other food than dry corn; for this purpose we should chuse a swine of about a year old, full of flesh and fat.

THE WILD BOAR is hunted by dogs, or else taken by surprise in the night by the light of the moon. As he runs but slowly, leaves a strong odour behind him, defends himself against the dogs, and wounds them dangerously, so he should not be hunted by dogs designed for the stag and the goat; for this hunting spoils their scent, and teaches them to go slowly. The oldest only should be attacked, and these are easily known by their traces; a young wild boar, of three years old, is difficult to take, because he runs a great way without stopping; instead of which, a wild boar that is older, does not run far, suffers himself to be closely hunted, and has no great fear of the dogs. In the day, he usually hides himself in the thickest and most unfrequented part of the wood, and in the evening, and at night, he goes out to seek for food. In summer, when the corn is ripe, it is easy to surprize him; but mostly so among oats, where he frequents every night. As soon as he is killed, the hunters immediately cut out the testes, the smell of which is so strong, that if five or six hours were to elapse without cutting them out, all the flesh would be infected; and in an old wild boar the head only is good to eat; instead of which, the flesh of the young wild boar is extremely delicate.

No person that has lived in the country ever so little, is ignorant of the profits arising from the hog: his flesh sells for more than that of the ox, the lard is valuable, the blood, the bowels, the viscera, the feet, and the tongue, when properly prepared, are all fit to eat. The dung of the hog is much colder than that of other animals, and should not be used for any but hot and dry lands. The skin has its use, for saddles are made of it; and brooms, brushes, and pencil-brushes are made of the hair. The flesh of this animal takes

salt and salt-petre better than any other, and will keep longer salted.

This species, though abundant, and greatly spread in Europe, in Africa, and in Asia, was not, however, found on the Continent of the New World. They were transported by the Spaniards, who have carried black hogs to the Continent, and to almost all the large islands of America; they are multiplied, and become wild in many places; and resemble our wild boars, with this difference, that the body is shorter, the head larger, and the skin thicker, and domestic hogs, in warm climates, are all black like wild boars.

THE HOG OF SIAM, resembles the wild boar more than the common hog. One of the most evident signs of degeneration is the ears, which become much more supple when the animal changes into the domestic state: in short, those of the domestic hog are not near so stiff, are much longer, and more pendant, than those of the wild boar, which should be looked on as the model of the species.

CHAP. VIII.

*On another class of domestic animals—The dog—Its varieties—
Of the cat, &c.*

THE DOG.

THE largeness of the make, the elegance of the form, the strength of the body, the freedom of the motions, and all the exterior qualities, are not the noblest properties in an animated being; and, as in mankind, understanding is preferred to figure, courage to strength, and sentiment to beauty; so the interior qualities are those which we esteem most in animals; for it is in these that they differ from the automaton, it is by these they are raised above the vegetable, and made to approach nearer to ourselves; it is their sense which ennobles their being, which regulates, which enlivens it, which commands the organs, makes the members active, gives birth to desire, and gives to matter progressive motion, will, and life.

The dog, independently of his beauty, vivacity, strength, and swiftness, has all the interior qualities which can attract the regard of man. The tame dog comes to lay at his master's feet his courage, strength, and talents, and waits

his orders to use them ; he consults, interrogates, and beseeches ; the glance of his eye is sufficient ; he understands the signs of his will. Without the vices of man, he has all the ardour of sentiment ; and what is more, he has fidelity and constancy in his affections ; no ambition, no interest, no desire of revenge, no fear but that of displeasing him ; he is all zeal, all warmth, and all obedience ; more sensible to the remembrance of benefits than of wrongs, he soon forgets, or only remembers them to make his attachment the stronger ; far from irritating, or running away, he even exposes himself to new proofs ; he licks the hand which is the cause of his pain, he only opposes it by his cries, and at length entirely disarms it by his patience and submission.

More docile and flexible than any other animal, the dog is not only instructed in a short time, but he even conforms himself to the motions, manners, and habits of those who command him ; he has all the manners of the house where he inhabits ; like the other domestics, he is disdainful with the great, and rustic in the country, always attentive to his master ; and striving to anticipate the wants of his friends, he gives no attention to indifferent persons, and declares war against those whose station make them importunate ; he knows them by their dress, their voice, their gestures, and prevents their approach. When the care of the house is intrusted to him during the night, he becomes more fiery and sometimes ferocious ; he watches, he walks his rounds, he scents strangers afar off ; and, if they happen to stop, or attempt to break in, he flies to oppose them, and, by reiterated barkings, efforts, and cries of passion, he gives the alarm. As furious against men of prey as against devouring animals, he flies upon, wounds, and tears them, and takes from them what they were endeavouring to steal ; but, content with having conquered, he rests himself on the spoils, will not touch it even to satisfy his appetite, and at once gives an example of courage, temperance, and fidelity.

Thus we may see of what importance this species is in the order of nature. By supposing for a moment that they had never existed ; without the assistance of the dog, how could man have been able to tame, and reduce into slavery, other animals ? How could he have discovered, hunted, and destroyed, wild and obnoxious animals ? To keep himself in safety, and to render himself master of the living universe, it was necessary to begin by making himself friends among animals, in order to oppose them to others. The first art

then, of mankind, was the education of dogs, and the fruit of this art was the conquest and peaceable possession of the earth.

The dog, faithful to man, will always preserve a portion of empire, and a degree of superiority over other animals; he commands them, and reigns himself at the head of a flock where he makes himself better understood than the voice of the shepherd; safety, order, and discipline are the fruits of his vigilance and activity; they are a people who are submissive to him, whom he conducts and protects, and against whom he never employs force unless it be to maintain peace. But it is above all in war against those animals which are his enemies, or which are independent, that his courage shines forth, that his understanding is displayed, and that his natural and acquired talents are united. As soon as the sound of the horn, or the voice of the huntsman, has given the signal of an approaching war, filled with a new ardour, the dog expresses his joy by the most lively transports, and shews by his motions, and cries of impatience, his desire to combat and to conquer; then, walking in silence, he searches to know the place where his enemy is, to discover, and surprise him; he seeks out his traces, he follows them step by step, and, by different cries, indicates the time, the distance, the species, and even the age of what he is in pursuit of.

In deserts, and depopulated countries, there are wild dogs, which in their manners differ only from wolves, by the facility with which they are tamed; they unite also in large troops, to hunt and attack by force wild boars and bulls, and even lions and tigers. In America, the wild dogs spring from a breed anciently domestic, having been transported from Europe; and having been either forgotten or abandoned in these deserts, they are multiplied to such a degree, that they go in troops to inhabited places, where they attack the cattle, and will sometimes even insult the inhabitants. They are then obliged to drive them away by force, and to kill them like other ferocious animals; and, in fact, dogs are such, till they become acquainted with man: but when we approach them with gentleness, they grow tame, soon become familiar, and remain faithfully attached to their masters; instead of which, the wolf although taken young, and brought up in the house, is only gentle in his youth, never loses his desire for prey, and, sooner or later, gives himself up to his fondness for rapine and destruction.

The dog may be said to be the only animal whose fidelity may be put to the proof; the only one which always knows his master and his friends; the only one which, as soon as an unknown person arrives, perceives it; the only one which understands his own name, and which knows the domestic call; the only one which has not confidence in himself alone; the only one which, when he has lost his master, and cannot find him, calls him by his lamentations; the only one which in a long journey, a journey that, perhaps, he has been but once, will remember the way, and find the road; the only one, in fine, whose talents are evident, and whose education is always good.

Of all animals, moreover, the dog is most susceptible of impressions, and most easily taught by moral causes; he is also, above all other creatures, most subject to the variety and other alterations caused by physical influence. The temperament, the faculties, and habits of the body vary prodigiously, and the shape is not uniform: in the same country, one dog is very different from another dog, and the species is quite different in itself in different climates.

But what is most difficult to ascertain in the numerous variety of different races, is the character of the primitive and original breed. How are we to know the effects produced by the influence of the climate, food, &c.?

As amongst domestic animals, the dog is, above all others, that which is most attached to man; that which, living like man, lives also the most irregularly; that in which sentiment predominates enough to render him docile, obedient, and susceptible of all impressions, and even of all constraint, it is not astonishing, that of all animals this should also be that in which we find the greatest variety, not only in figure, in height, and in colour, but in every other quality.

There are also some circumstances, which still concur to this change: the dog in general lives but a short time; he produces frequently, and in pretty large numbers; and as he is perpetually beneath the eyes of man, as soon as by a chance usual to nature, there may have been found among some individuals, singularities, or apparent varieties, endeavours may have been used in order to perpetuate them, by uniting together these singular individuals, as we do at present, when we want to procure new breeds of dogs, and other animals.

Dogs which have been abandoned in the deserts of America, and have lived wild for a hundred and fifty, or two

hundred years, though changed from their original breed since they are sprung from domestic dogs, have, notwithstanding this long space of time, retained, at least, in part, their primitive form, and travellers report that they resemble our greyhound. These wild dogs, however, are extremely thin and light; and as the greyhound does not differ much from the cur, or from the dog which we will call the shepherd's dog, it is natural to think, that these wild dogs are rather of this species, than real greyhounds; since on the other side, antient travellers have said, that the dogs of Canada had the ears straight like foxes, and resembled the middle-sized mastiff, that is, our shepherd's dog, and that those of the deserts of the Antilliers isles had also the head and ears very long, and in appearance very much resemble foxes.

Besides this, in searching with a view to find what travellers have said of the forms of dogs of different countries, we find, that dogs of cold climates have all long snouts and straight ears; that those of Lapland are small, that their ears are straight, and their snouts pointed; that those of Siberia, known by the name of wolf-dogs, are larger than those of Lapland; but that they have also the ears straight, the hair rough, and the snout pointed; that those of Iceland have also some resemblance to those of Siberia; and that, even in warm climates, such as the Cape of Good Hope, the dogs natural to the countries have sharp snouts, straight ears, the tail dragging on the ground, and the hair shining, but long and frizzled.

We may presume, then, with some appearance of truth, that the shepherd's dog is, of all dogs, that which approaches nearest to the primitive races of this species; since, in all countries inhabited by savages, or, at least, by men half-civilized, the dogs resemble this breed more than any other; since, on the whole continent of the new world, they had no other; since they are to be found only in the north and south of our continent, and since, in France and England, where this species is usually called the shepherd's dog, and in other temperate climates, it is still more numerous; though we are much more occupied in giving birth to, or in multiplying, the breeds which are more pleasing, than preserving those which are more useful, and which we have disdained and abandoned to the peasants who have the care of our flocks.

The dog, when he is born, is not entirely finished. In this species, as in those of all animals which produce, in

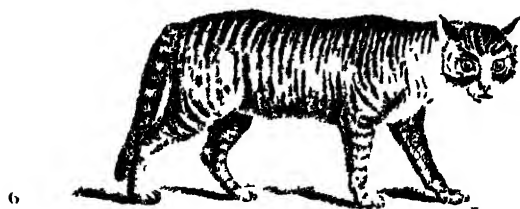
great numbers, the young ones, at the time of their birth, are not so perfect as those of animals which only produce one or two. Dogs are commonly born with their eyes shut: the two eye-lids are not only closed, but adhere by a membrane, which breaks away as soon as the muscle of the superior eye-lid is become strong enough to raise itself, and to overcome this obstacle; and the greater number of dogs have not their eyes open till the tenth or twelfth day. At this time, the bones of the skull are not finished, the body is puffed out, the snout is swelled, and they have not their proper form; but in less than a month they learn to make use of all their senses, and begin to have strength and a swift growth. In the fourth month, they have some of their teeth; and these, as in other animals, are soon replaced by others, which do not fall out again: they have in all forty-two teeth.

Bitches go with young nine weeks, that is, sixty-three days, but never less than sixty. Length of life in dogs is like that of other animals, proportioned to the time required for their growth; for if they are about two years in growing, so they live also twice seven years.

In the Memoirs, of the Academy of sciences, we find the history of a bitch, which having been accidentally left behind in a country-house, subsisted forty days without any other food than the stuff or the wool of a mattrass that she had torn. Water seems to be still more necessary for dogs than food: they drink frequently and abundantly; and it is even a vulgar opinion, that if they want water for any length of time, they become mad.

To give a clearer idea of the order of dogs, of their generation in different climates, and of the mixture of their breeds, I here join a table, or rather a kind of genealogical tree, in which, with a glance of the eye, all the different varieties of the species may be seen.

The *shepherd's dog* is the stock or body of the tree. This dog, transported into the rigorous climate of the North, as into Lapland, for example, has become ugly and small; he seems, however, to have been kept up, and even brought to perfection, in Iceland, Russia, and Siberia, where the climate is rather less rigorous, and where the people are more civilised. These changes have been occasioned by the influence of climate alone, which has produced no great alteration in the form; for all these dogs have straight ears, long and thick hair, and a wild look.



1. Bull Dog. — 2. Pug Dog. — 3. Shepherd Dog.
4. Domestic Cat. — 5. Greyhound. — 6. Wild Cat.

The same shepherd's dogs, transported into temperate climates, and among people who are quite civilized, such as those of England, France, or Germany, lose their savage air, their straight ears, their long, thick, and rough hair, and become *mastiff*, *hound*, or *bull-dog*, by the influence of climate merely. Of the mastiff, and the bull-dog, the ears are still partly straight, or only half-pendant; and in their manners and sanguinary disposition they resemble the dog from which they drew their origin. The hound is the most distant of the three: the long pendant ears, the docility, gentleness, and, we may say, timidity of this dog, are so many proofs of the great degeneration, or, better, perhaps, to express it, the great perfection, which a long state of subjection has produced, joined to a careful, and well-followed education.

The *hound*, the *setting-dog*, and the *terrier*, are only one and the same race of dogs; for it has been remarked, that the same birth has produced setting-dogs, terriers, and hounds, though the hound bitch has only been covered by one of the three dogs.

The *beagle*, and almost all sorts of dogs transported into Spain and Barbary, have the hair fine, long, and thick, and become *spaniels* and *barbets*. The great and little spaniel, which differ only in size, when transported into England, change their colour from black to white, and, by the influence of the climate, are become large, small, and shaggy: to these we may also join the terrier, which is but a black beagle, like the others, but with liver-coloured marks on the fore feet, the eye, and the snout.

The shepherd's dog, transported to the north, is become a *large Dane*, and into the south, is become a *greyhound*. The large greyhounds come from the Levant; those of a middling size from Italy: and greyhounds from the latter of these places, when transported into England, become smaller greyhounds.

The large Danes, transported into Ireland, Ukrain, Tartary, Epirus, and Albania, are become large *Irish dogs*, and in size surpass all the rest of the species.

The bull-dog, transported from England into Denmark, is become a *small Dane*; and this small Dane, when transported into warm climates, loses its hair entirely, and becomes the naked *Turk dog*. All these races with their varieties, have been produced solely by the influence of climate, joined to the effect of their food, and of a careful

education ; the other dogs are not of a pure race, and come from a mixture of these first races.

The greyhound, and the shepherd's dog, have produced the *mongrel greyhound*, which is called the greyhound with wolf's clothing. Of this mongrel the snout is not so slender as that of the Turkish greyhound, which is very rare in France.

The large Dane, and the large Spaniel, have produced together the *dog of Calabria*, which is a handsome dog with long, thick hair, and which is taller than the larger mastiff.

The spaniel and the terrier produce another kind of dog, which is called the *Burgundy spaniel*. The spaniel and the little Dane produce the *lion-dog*, which is very scarce.

The dogs with long, fine, and curled hair, which are called *dogs of Burgos*, and which are of the size of the largest barbets, come from the large spaniel and the barbet.

The *little barbet* comes from the small spaniel and the barbet.

The bull-dog produces, with the mastiff, a mongrel, which is called the *strong bull-dog*, and is much larger than the real bull-dog, and approaches the bull-dog more than the mastiff.

The *pug* comes from the English bull-dog, and the little Dane.

All these races are simple mongrels, and come from the mixture of two pure races ; but there are also other dogs which may be called double mongrels, because they come from the mixture of a pure race, and of one already mixed.

The *shock-dog* is a double mongrel, which comes from the pug and the small Dane.

The *dog of Alicant* is also a double mongrel, which comes from the pug and the little spaniel.

The *Maltese*, or lap-dog, is a double mongrel, and comes from the small spaniel and the barbet.

THE CAT,—though an animal of prey, is a useful domestic. It is neither wanting in sagacity nor sentiment ; but its attachments are stronger to places than to persons. The form of its body corresponds with its disposition. The cat is handsome, light, adroit, cleanly, and voluptuous : he loves ease, and searches out the softest furniture in order to repose on, and rest himself.

Cats go with young fifty-five or fifty-six days ; they are not so prolific as dogs, and their usual number is four, five, or six. Young cats are gay, lively, pretty, and would be very proper to amuse children, if the strokes of their paws were not to be feared. Their disposition, which is an enemy to all restraint, renders them incapable of a regular education. We are told, nevertheless, of the Greek Friars of Cyprus, having taught cats to hunt, take, catch, and destroy the serpents with which that island was infested ; their scent, which in the dog is an eminent quality, is far from being good, and therefore they do not pursue animals which they no longer see ; they do not hunt, but wait and attack them by surprise.

The most immediate physical cause of this inclination, which they have to spy out, and surprise other animals, comes from the advantage which they receive from the particular conformation of their eyes. The pupil, in man, as well as in the greater part of animals, is capable of a certain degree of contraction and dilatation ; it enlarges a little when there is no light, and contracts when it becomes too strong.

In the eye of the cat, and of nocturnal birds, this contraction and dilatation are so considerable, that the pupil, which in obscurity is large and round, becomes, in broad day, long and narrow like a line ; and for this reason these animals see better during the night than during the day, the form of the pupil being always round when it is not constrained. During the day, there is a continual contraction in the eyes of the cat, and it is only by effort, as it were, that he sees in a strong light ; whereas at twilight, the pupil resuming its natural form, he sees perfectly, and profits from this advantage to know, attack, and surprise other animals.

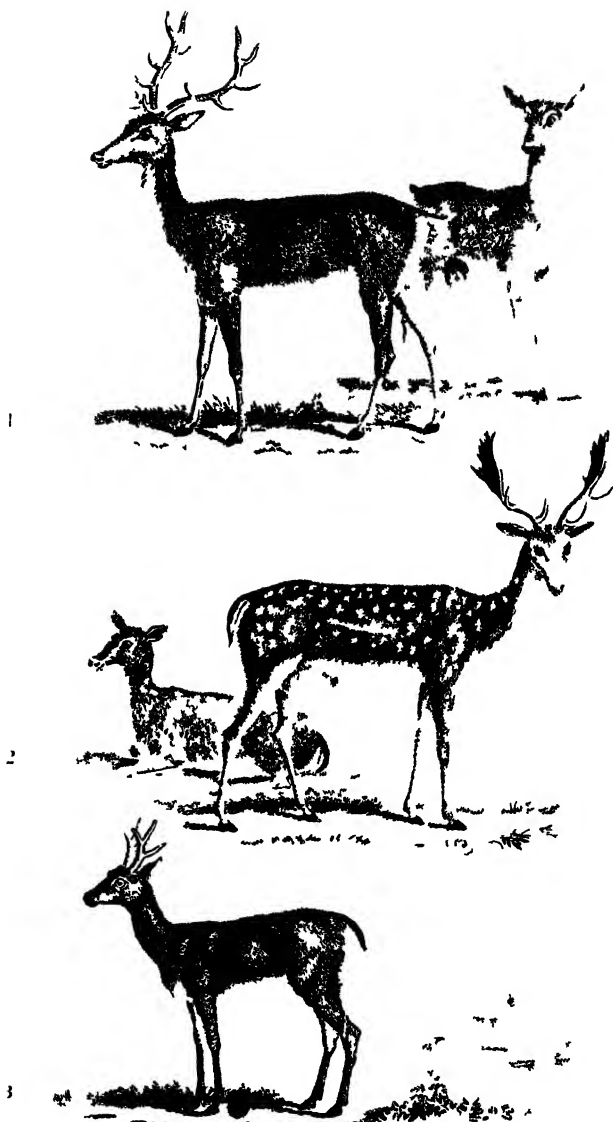
Cats seem to have a natural dread of water, cold and bad smells. They are very fond of perfumes, and gladly suffer themselves to be taken and caressed by persons who use them. The scent of Valerian has so powerful and so delicious an effect on them, that they appear transported with pleasure by it ; and in order to preserve this plant in gardens, it is common to surround it with a close fence. Cats will smell it from afar, will run and rub themselves with it, and will pass and repass so often over it, as to destroy it in a short time.

As they are exceedingly cleanly, and as their coat is always dry and shining, their hair easily electrifies ; and

sparks are seen to come from it, when rubbed with the hand in any dark place. Their eyes shine in the dark, almost like diamonds, and reflect outwardly during the night, the light which they may be said to have imbibed during the day.

In this climate, we know but one species of the *wild cat*; and it appears from the testimony of travellers, that this species is found in almost all climates, without any great variety. There were some of them on the continent of the New World before it was discovered: a huntsman carried one which he had found in the woods to Christopher Columbus; this cat was of the common size, the hair of a dark grey, with the tail very long, and very strong. There are some of the same sort of wild cats in Peru, though they had no tame ones; and there are also some in Canada, in the country of the Illenoiense, &c. They have been seen in several parts of Africa, as in Guinea, at the Gold Coast; at Madagascar, where the original inhabitants had even domestic cats; at the Cape of Good Hope, where Kolbe says, there are also, though in a small number, wild cats of a blue colour; and these blue, or rather slate-coloured cats, are found again in Asia.

In general it may be remarked, that of all the climates of the inhabited earth, those of Spain and Syria are the most favourable to the beautiful varieties of nature. The sheep, the goats, the dogs, the cats, the rabbits, &c. of those countries have the finest wool, the most beautiful and the longest hair, the most agreeable and the most varied colours. The colour of the wild cat, and its hair, like those of most other wild animals, are rather coarse; when tamed, the latter becomes softer, the former more variegated; and in the favourable climate of Chorasan and Syria, the latter becomes longer, finer, more copious, the former uniformly softened; the black and red changing into a transparent brown, and the dark brown into an ash-grey. By comparing a wild cat of our forests with one of those of Chorasan or Syria, we shall find that the only difference between them consists in this shaded variety of colours; and as these animals have more or less white upon the belly and the sides, it is easy to conceive, that, in order to have cats entirely white, and with long hair, such as we properly term *cats* of *Angora*, we have only to select from this race those which are most white on the belly and the sides, and to unite them together, in like manner as is done with rabbits, with dogs, with goats, with stags, with deer, &c. In the province of



1. Stag or Red Deer, Male & Female. 2. Fallow Deer, Male & Female. 3. Red deer.

Pe-chi-ly, in China, there are cats with long hair, and pendant ears, of which the Chinese ladies are exceedingly fond. These domestic cats, with pendant ears, of which we do not possess a more ample description, are, doubtless, still more remote than those with straight ears, from the race of the wild cat, which, nevertheless, is the original and primitive race of all cats.

CHAP. IX.

Of certain intermediate Animals between wild and domestic.—The Stag, or Red Deer.—Of the Fallow-deer, the Roebuck, &c.

THE STAG is one of those mild, tranquil, innocent animals, which seem as if they were created solely to adorn and animate the solitude of the forests, and to occupy, remote from man, the peaceful retreats of Nature. His light and elegant form; his flexible, yet nervous limbs; his head rather adorned, than armed, with a living substance, which, like the branch of a tree, is every year renewed; his size, his swiftness, his strength, sufficiently distinguish him from the rest of the inhabitants of the forest.

The old stags shed their horns first, which happens about the end of February, or the beginning of March. Stags in their seventh year do not undergo this change till the middle or the end of March; nor do those in their sixth year, till the month of April.

After they have shed their horns, they separate from each other; the very young ones alone associating together. They remain no longer in covert; they seek the beautiful parts of the country, the groves, and the open coppices, where they remain all the summer, till they recover the antlers which were wont to adorn their brows; and, during this season, they carry their heads low, for fear of striking them against the branches; for they are exceedingly tender till they arrive at perfection. The horns of the oldest stags are scarcely half repaired by the month of May; nor do they attain their full length and hardness till about the end of July. The horns of the young stag are very late shed, and very late recovered; but when these are completely lengthened, and are become quite hard, they rub them against the trees, in order to clear them from the scurf with which they are covered.

The hinds, or females, carry their young eight months and a few days. They are not all prolific; and one sort there is in particular which is always barren. The fawn retains this appellation no longer than till it is six months old; then the knobs begin to appear and it takes the name of a knobber, which it bears till these knobs are lengthened to so many points, whence they are termed prickets, or brockets. It does not quit its mother early, though it grows fast, but follows her all the summer. In winter, the hinds, the knobbers, the prickets, and the young stags, resort to the herd, forming troops, which are more numerous in proportion as the season is more severe. In spring they divide, the hinds retiring to bring forth their young; and at this time there is scarcely any but the prickets and the young stags, which go together. In general, the stags are inclined to remain with each other, and to roam abroad in companies; it is only from fear or necessity that they are ever found dispersed or separated.

The growth of the horns appears to depend on the redundancy of the fluids, and has a near connection with the production of the seminal fluid, since, when castrated, the horns of the stag cease to grow. The beauty of this, as indeed of every part, depends much upon their food; for a stag which lives in a plentiful country, where he feeds at his ease, where he is neither disturbed by men nor dogs, where, after having eaten without interruption, he may lie down and ruminate in quiet, has always a beautiful head, high, open, palmated, large, and well-adorned at top, broad and curled at bottom, with a great number of long and strong antlers; whereas, in a country where he has neither sufficient food nor repose, his head will be in these respects the reverse, insomuch, that it is no difficult matter to distinguish by the horns of a stag, whether or not he inhabits a plentiful and quiet country, and whether or not he has been well nourished.

The branches which sprout from the head of the stag, in their make and growth, resemble those of a tree; their substance also is, perhaps, more of the nature of wood than of bone: it is, as it were, a vegetable grafted upon an animal, which partakes of the nature of both, and forms one of those shades by which Nature always approximates two extremes.

The stag passes his whole life in the alternatives of plenty and want, of corpulence and leanness, of health and sickness, without having his constitution much affected by

the violence of the change; nor is the duration of his life inferior to that of other animals, which are not subject to such vicissitudes. As he is five or six years in growing, so he generally lives seven times that number of years; that is, thirty-five or forty years. What has been reported, therefore, concerning the prodigious longevity of the stag, is without any good foundation, though supported by the story of one which was taken by Charles VI. in the forest of Senlis, with a collar round his neck whereon was inscribed, "*Cæsar hoc me donavit:*" and people chose rather to believe that this animal had lived a thousand years, and had received this collar from a Roman Emperor, than to conclude that he might come from Germany, where the Emperors have always assumed the title of Cæsar.

The horns of the stag continue to increase in bulk and height from the second year to the eighth; they remain beautiful, and much the same, during their vigour of life; but as their body declines with age, so do their horns decline also.

It is but seldom that our stags have more than twenty or twenty-two antlers even when their head is in its most beautiful state; and, as the size of the stag's head depends on the quantity of his food, so the quality of his horns is found also to depend on the kind of nourishment he receives; it is, like the wood of the forest, large, soft, and light, in moist and fertile countries; and, on the contrary, short, hard, and heavy, in such as are dry and barren.

The most common colour of the stag is yellow, though there are many found of a brown, and many of a red colour. White stags are much more uncommon, and seem to be stags become domestic. The colour of the horns, like that of the hair, seems in particular to depend on the nature and age of the animal. The horns of the young stags are whiter than those of the old ones. Of those stags also whose hair is of a light yellow, the horns are often of a sallow hue, and disagreeable to the eye.

This animal seems to have good eyes, an exquisite smell, and an excellent ear. When he would hearken to any thing, he raises his head, pricks up his ears, and then he hears from a great distance. When he issues from a little coppice, or some other spot half covered, he stops, in order to take a full view around him, and then snuffs up the wind, in order to try whether he can discover the scent of aught that may give him disturbance. Though naturally rather

simple, he is yet far from being destitute of curiosity and cunning. If any one whistles, or calls aloud to him from a great distance, he instantly stops short, and gazes with fixed attention, with even a kind of admiration; and if he sees neither arms nor dogs, he passes along quietly, and without altering his pace. With equal tranquillity and pleasure he seems also to listen to the shepherd's pipe, or flagelet; and the hunters, in order to embolden them, sometimes use these instruments. In general, he fears men much less than he does dogs, and entertains neither distrust nor artifice, but in proportion as he is disturbed. He eats slowly, chooses his food and seeks afterwards to repose himself, that he may ruminate at leisure, though the act of rumination he does not seem to perform with the same ease as the ox; nor is it without undergoing much violence, that the stag can throw up the food contained in his first stomach. He seldom drinks in the winter, and seldomer still in the spring.

THE FALLOW-DEER. No two animals can be more nearly allied than the stag and the fallow-deer; and yet no two animals keep more distinct, or avoid each other with more fixed animosity. They are never seen to herd in the same place; it is even rare, unless they have been transported thither, to find fallow-deer in a country where stags are numerous. They seem to be of a nature less robust and less savage than the stag; they are found but rarely wild in the forests, and are bred up in parks, where they are, as it were, half domestic.

England is the country of Europe where they most abound; and there their flesh, which dogs are observed to prefer to that of all other animals, is held in no small estimation. It seems to be an animal formed for a temperate climate; for it is never found in Russia, and very rarely in the forests of Sweden, or in any other northern country; and as the fallow-deer is an animal less savage, more delicate, and, indeed, it may be added, more domestic than the stag, it is likewise subject to a greater number of varieties. Beside the common deer, and the white deer, we know of several other kinds still; the deer of Spain, for example, which are almost as large as stags, but whose neck is more slender, whose colour is more obscure, and whose tail is rather black than white underneath, and longer than that of the common deer; the deer of Virginia, which are almost as large as those of Spain; other deer, whose forehead is compressed and flattened between the eyes, whose ears and tail

are longer than those of the common deer, and of whose hind legs the hoofs are marked with a white spot; and others, which are spotted or streaked with white, black, and yellow; and others still, which are entirely black.

The horns of the buck, like those of the stag, are shed every year, and take nearly the same time for repairing.

It frequently happens, that a herd of fallow-deer is seen to divide into parties, and to engage each other with great ardour. Each seems desirous of gaining some favourite spot of the park for pasture, and of driving the vanquished party into the coarser and more disagreeable parts. Each of these factions has its particular chief, namely, the oldest and the strongest of each herd. These lead on to the engagement; and the rest follow under their direction. Their combats are singular enough, from the disposition and conduct by which their mutual efforts seem to be regulated. They attack with order, and support and assault with courage; they come to the assistance of each other; they retire, they rally, and never yield the victory upon a single defeat. The combat is renewed every day, till at length the most feeble side is obliged to give way, and is content to escape to the most disagreeable part of the park, where alone they can find safety and protection.

From the age of two years till that of fifteen or sixteen, the fallow-deer is in a condition to produce, and, in fine, resembling the stag in all its natural habits, the greatest difference we find between these two animals, is in the duration of their lives. From the testimony of hunters, it has been mentioned, that the stag lives to the age of thirty-five or forty; and, on the same authority, it is asserted, that the fallow-deer lives but about twenty years; and as in size the latter is smaller than the stag, so it is probable, that in growth he is somewhat quicker.

THE ROE-BUCK. The stag, as being the most noble among the tenants of the woods, inhabits the most secret parts of the forest where the spreading branches form a lofty covert; while the roe-buck, as being of an inferior species, contents himself with a more lowly residence, and is seldom found but among the thick foliage of young trees and shrubs. But, if this animal is less noble, less strong, and less elevated in stature, he is, however, possessed of more grace, more vivacity, and even more courage, than the stag. Though but a very small animal, yet, when his young are attacked, he faces even the stag himself, and not

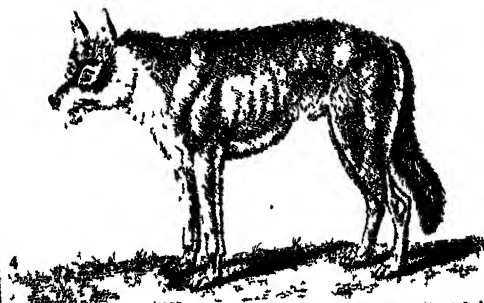
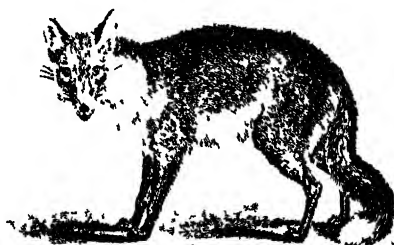
unfrequently comes off victorious; he is more gay, more handsome, more active; his shape is more full and more elegant, and his figure is more agreeable; his eyes, in particular, are more brilliant, and more animated: his limbs are more supple, his movements quicker; and possessed of equal vigour and agility, he bounds without effort.

The roe-buck differs from the stag, not only in superior cunning, but also in his natural appetites, his inclinations, and his whole habits of living. Instead of herding together like the latter, the species of the former live in separate families: the sire, the dam, and the young ones, form of themselves a little community, nor do they ever admit a stranger into it. All other animals of the deer kind are inconstant in their affection. The roe-buck never forsakes his mate; and, as they have been generally bred up together, the male and female form for each other the strongest attachment.

The female of this species goes with young five months and a half, and brings forth about the end of April, or the beginning of May. The hind goes more than eight months; and this is a circumstance which alone suffices to prove, that these animals are of a species so different, that they can never intermix, nor produce together an intermediate race. The female separates herself from the male, when she is about to bring forth, retiring into the thickest part of the woods in order to avoid the wolf, which is her most dangerous enemy. At the expiration of about ten or twelve days, the fawns, of which there are generally two at a birth, attain strength enough to follow her. When she is threatened with any danger, she hides them in some deep thicket, offers herself to the danger, and allows herself to be chased in their stead.

The fawns continue to follow the buck and the doe eight or nine months in all; and, upon separating, their horns begin to appear, as those of the stag the first year, simple, and without antlers. These they shed at the latter end of autumn, and renew during the winter.

In the stag, the fallow-deer, and the roe-buck, there are two bony eminences, on which their horns grow, which begin to shoot at the end of five or six months, and which, in a little time longer, arrive at their full growth; and far from enlarging themselves as the animal advances in age, they diminish, and are even the most certain index for discovering every year, the advanced age of all the species.



1. Rabbit - 2. Hare - 3. Fox - 4. Wolf

As the female goes only five months and a half with young, and as the growth of the young roe-buck is quicker than that of the young stag, so his life is shorter, and does not appear to extend beyond twelve or fifteen years, at the farthest. The roe-bucks remain in winter in the thickest coppices, and live on briars, broom, heath, &c. In spring they repair to the more open groves, and browse upon the buds and young fresh leaves of almost every tree; and this warm food, fermenting in their stomachs, inebriates them in such a manner, that they are then easily surprised.

It appears, that this species which is not so numerous as that of the stag, and which is very seldom to be found in many parts of Europe, is much more abundant in America. There we hear only of two sorts, the red, which is the larger, and the brown, which is the smaller; and, as they are more commonly found in the northern than in the southern parts of that continent, so it may be presumed, that they differ more from each other there than they do in Europe. In Louisiana, for instance, they are extremely common, and are much larger than in France; they are also found at Brasil; for the animal which is there denominated the *Cujuacu-apara*, differs not from the European roe-buck, more than the Canadian stag differs from the French stag.

CHAP. X.

Of Wild Animals—The Hare and the Rabbit.

THE HARE.

THOSE species of animals which are the most numerous, are not always the most useful: but the species of the hare, and of the rabbit, are advantageous to us, both as to their number and their utility. Hares are universally and abundantly spread over the face of the whole earth; and rabbits, though they originated only in particular climates, do yet multiply so prodigiously in almost every place to which they are transported, that it is no longer possible to extirpate them, and no small art is required in order to diminish their number.

In those districts which are reserved for the chase, four or five hundred hares are killed in the course of perhaps one day's sport. These animals multiply amazingly; they are in a condition to engender in all seasons, and before the

first year of their life is expired. The females do not go above thirty or thirty-one days with their young. They produce three or four, and, as soon as these are brought forth, are again ready to receive the male; they likewise receive him while they are pregnant, and, by a particular formation of their genitals, are often found to have a superfœtation.

The young ones are brought forth with their eyes open; the mother suckles them for the space of twenty days; after which they separate themselves from her, and provide for their own subsistence; they do not withdraw themselves far from each other, nor from the place where they first drew breath; yet they live in solitude, and each composes for itself a form, at a little distance, perhaps sixty or eighty paces. Thus when we find a young leveret in one place, we are almost sure of finding one or two more in the neighbourhood. They feed more by night than by day; and their favourite articles of provision are, herbs, roots, leaves, fruit, and grain; but above all, such plants as yield a milky juice. They even eat the bark of trees in winter. When they are reared at home, they are fed with lettuce and roots; but the flesh of these domestic hares is always of a bad flavour.

Hares sleep much, but always with their eyes open. They have no eye-lashes, and seem to have but bad eyes; as if, however, to compensate for this defect, their hearing is exceedingly acute, and their ears are very large compared with the size of their body. They move these long ears with great facility, and use them as a helm, in order to direct their course, which is so rapid, that they easily outstrip all other animals. As their fore legs are much shorter than their hind legs, they can more easily ascend than descend; for which reason, when they are pursued, their first object is to gain, if possible, some mountain. Their motion in running is a kind of gallop; they proceed without making any noise, because their feet are plentifully covered with hair, even underneath; and perhaps they are the only animals which have hair growing within their mouths.

Hares live not above seven or eight years. They pass their lives in solitude, and in silence; and never are known to exert their voice, but when they are forcibly laid hold of, tormented, or wounded. They are by no means so wild as by their habits might be supposed; they are gentle, and susceptible of a species of improvement. As they have a good ear, as they rest on their hind-feet of their own accord, and

use their fore-legs like arms, some have been so tutored as to beat a drum, to gesticulate in cadence, &c.

In general, the hare is not devoid of the instinct necessary for its preservation, nor of sagacity sufficient to effect an escape from its enemies. It prepares for itself a form; and in winter it chooses a spot which is exposed to the south, as in summer it does one which is situated to the north. It hides itself from view among hillocks of earth which are of the same colour as its hair. "I have seen," says Du Fouilloux, "a hare so cunning, that, as soon as it heard the huntsman's horn, it started from its form, and, though at the distance of a quarter of a league from it, leaped to a pond, and there hid itself among the rushes, and thus escaped the pursuit of the dogs. I have seen a hare, which, after having run above two hours before the dogs, has dislodged another hare, and taken possession of its form. I have seen others swim over three ponds, of which the smallest was not less than eighty paces broad. I have seen others, which, after having been warmly chased for two hours, have entered a sheep-cot, through the little opening under the door, and remained among the cattle. I have seen others, which, when the dogs have chased them, joined a flock of sheep in the field, and, in like manner, remained with them. I have seen others, which, when they heard the dogs, have concealed themselves in the earth. I have seen others, which have gone along one side of a hedge, and returned by the other; so that there was only the thickness of the hedge between the dogs and the hare. I have seen others, which, after they had been chased for half an hour, have mounted an old wall of six feet high, and taken refuge in a hole covered with ivy."

The nature of the soil has a great influence on these, as well as on all other animals; the hares of the mountains are larger and fatter than those of the plains, and are also of a different colour; the former being browner on the body, and whiter about the neck than the latter, which are more inclined to red. On high mountains, and in the northern countries, they become white in the winter, and in summer recover their ordinary colour.

THE RABBIT. Though the hare and the rabbit are externally, as well as internally, very much alike, yet as they do not intermix together, they form two distinct and separate species.

The fecundity of the rabbit is even greater than that of the hare; and, without crediting what Wotton has advanced, that one pair only, being left together in an island, produced six thousand in one year, it is certain, that these creatures multiply so prodigiously in countries which are proper for the breed, that the earth cannot furnish them with subsistence: they destroy herbs, roots, grain, fruit, and even trees and shrubs; and, were it not for the use we make of the dog and the ferret, they would reduce the country to a desert. The rabbit not only engenders and produces oftener than the hare, but it has more ways to escape from its enemies, and to avoid the sight of man.

This circumstance alone may suffice to prove, that the rabbit is superior to the hare in point of sagacity. Both are alike in their conformation, and both have it in their power to dig retreats for themselves. Both are timid to an excess; but the one, possessed of less art, is contented with forming a residence on the surface of the earth, where it remains continually exposed; while the other, by a more improved instinct, takes the trouble to dig into the earth, and there to make itself an asylum; and so true is it, that they act in this case from a kind of reason or reflection, that we never see the domestic rabbit employed in the same work.

The domestic rabbits, like all other domestic animals, vary in their colour: white, black, and grey, belong properly to Nature. The black rabbits are the most scarce.

These animals are able to engender and produce at the age of five or six months. It is asserted, that they commonly attach themselves to one particular female, and never quit her. She goes with young thirty or thirty-one days, and will produce five, six, and sometimes seven or eight at a birth. Like the doe-hare, she has a double matrix, and of consequence can have in her womb at the same time, two separate litters. It appears, however, that superfœtations are less frequent in this species than in that of the hare.

A few days before they bring forth, they dig a fresh burrow, not in a right line, but in a crooked direction, at the bottom of which they make an excavation; after which they tear a quantity of hair from their bellies, and make a kind of bed for the use of their little ones. For the first two days they never quit them: they never stir abroad, unless forced to do so from necessity, and return as soon as ever they have taken their nourishment. At this season they eat much and very quick; and thus they tend and suckle their young for more than six weeks. Till then the buck does not know

them, nor does he enter the burrow which the doe has dug. Often, even when she quits it and leaves her little ones behind, she stops up the entry to it with earth, wet with her urine; but when they begin to venture to the edge of the hole, and to eat groundsel and other herbs which the doe picks out for them, the buck begins to know them, to take them between his paws, to endeavour to give a gloss to their hair, to lick their eyes; and all of them, in succession, partake equally of his cares.

A gentleman, who had amused himself with raising rabbits for many years, has communicated the following remarks:—

“I began,” said he, “with only one male and one female, the former white, the latter grey; and of their produce, which was very numerous, the greatest part were grey, a good number of them white, and of a mixed colour, and some few black. These animals seem to have a great respect for paternal authority; at least I judge so, from the great deference which all my rabbits shewed for their first ancestor, whom I can always easily distinguish by his whiteness, and who is indeed the only male of that colour which I have preserved. It was to no purpose that the family augmented; those which, in their turn, became fathers, were still subordinate to him. Whenever they fought, whether on account of their females, or concerning their food, their great progenitor would run to the place of dispute with all speed, as soon as he heard the noise. No sooner did they perceive him, than every thing was presently reduced to order; and if he surprised any one of them actually assaulting another, he used to separate him from the rest, and punish him upon the spot. Another proof of his dominion over all his posterity, is, that they were accustomed to return at a whistle: whenever I gave the signal, how distant soever they might be, this old one immediately put himself at their head; and though he came first, yet he made them all file off, and enter before him; nor would he go in till the last.”

CHAP. XI.

Of carnivorous Animals—The Wolf—The Fox—The Badger—The Otter—The Martin—The Pine Weasel—The Pole Cat—The Ferret—The Weasel—The Ermine.

ANIMALS which have but one stomach, and whose intestines are short, are forced, like man, to feed on flesh. Of this affinity, and of this truth, we shall receive certain information by a relative comparison of the size of the intestinal canal in carnivorous animals, and in those that live solely on herbage. We shall then find, that the difference in their manner of living depends solely on the difference in their conformation, and that their nourishment is more or less solid, as the receptacle for it is more or less capacious.

Hence, however, it is not to be concluded, that those animals which live solely on herbage are, from physical necessity, as carnivorous animals are with respect to flesh, absolutely confined to one kind of sustenance. It is only to be understood, that those which have several stomachs, or very large intestines, may be supported without this substantial aliment so necessary to others. It is not meant, that they might not use it, or that if Nature had furnished them with arms, not only for the purposes of self-defence, but for those of attack and rapine, they would not have exerted them, and soon accustomed themselves to flesh and blood; since we find, that sheep, calves, goats, horses, greedily eat milk and eggs, which are animal food, and that, unaided by custom, they do not refuse meat which has been hashed and seasoned with salt.

Without a violation of truth, then, it may be said, that the generally predominant appetite of animals is for flesh and other solid food, and that this appetite is more or less vehement, more or less moderate, according to the particular conformation of each animal; since, on taking a full view of Nature, we find it not only in man, but in quadruped animals, in fishes, in insects, and in worms, for which indeed all flesh seems to be particularly and ultimately destined.

THE WOLF is one of those animals whose appetite for animal food is the most vehement, and whose means of

satisfying this appetite are the most various. Nature has furnished him with strength, with cunning, with agility, with all those requisites, in a word, which fit an animal for pursuing, overtaking, and conquering its prey; and yet, with all these, the wolf most frequently dies of hunger; for he is the declared enemy of man. Being long proscribed; and a reward offered for his head, he is obliged to fly from the habitations of man, and to live in the forest, where the few wild animals to be found, escape him either by their swiftness or their art, or are supplied in too small a proportion to satisfy his rapacity. When pressed with hunger, however, he braves danger, and comes to attack those animals which are under the protection of man, particularly such as he can readily carry away, lambs, sheep, or even dogs themselves; for all animal food comes then equally agreeable. If this excursion has succeeded, he often returns to the charge, till having been wounded, or closely pursued by the dogs or the shepherds, he hides himself by day in the thickest coverts, and, for a while, only ventures out at night; but, at last, when his necessities are very urgent, he boldly faces certain destruction: he attacks women and children, and sometimes ventures even to fall upon men; becomes furious by his continual agitations, and ends his life in madness.

The wolf, as well externally as internally, so nearly resembles the dog, that he seems modelled upon the same plan; and yet he only offers the reverse of the image. If his form be similar, his nature is different; and indeed they are so unlike in their dispositions, that no two animals can have a more perfect antipathy to each other. A young dog shudders at the sight of a wolf; a dog who is stronger, and who knows his strength, bristles up at the sight, testifies his animosity, attacks him with courage, endeavours to put him to flight, and does all in his power to rid himself of a presence that is hateful to him. They never meet without either flying from, or fighting with each other. If the wolf is the stronger, he tears and devours his prey: the dog, on the contrary, is more generous, and contents himself with his victory.

The dog, even in his savage state, is not cruel; he is easily tamed, and continues firmly attached to his master. The wolf, when taken young, becomes tame, but never has an attachment. Nature is stronger in him than education; he resumes, with age, his natural dispositions, and returns, as soon as he can, to the woods whence he was

taken. Dogs, even of the dullest kinds, seek the company of other animals; they are naturally disposed to follow and accompany other creatures: the wolf, on the contrary, is the enemy of all society; he does not even keep much company with those of his kind. When they are seen in packs together, it is not to be considered as a peaceful society, but a combination for war: they testify their hostile intentions by their loud howlings, and by their fierceness discover a project for attacking some great animal, such as a stag or a bull, or for destroying some formidable dog. The instant their military expedition is completed, their society is at an end; they then part, and each returns in silence to his solitary retreat. There is not even any strong attachment between the male and female; they seek each other only once a year, and remain but a few days together.

The difference in the duration of the pregnancy of the she-wolf, who goes with young above an hundred days, and the bitch, who does not go above sixty, proves, that the wolf and the dog, so different in disposition, are still more so in one of the principal functions of the animal œconomy.

The wolf generally brings forth five or six, and sometimes even nine at a litter. The cubs are brought forth, like those of the bitch, with the eyes closed. The dam suckles them for some weeks, and teaches them betimes to eat flesh, which she prepares for them, by chewing it first herself. They do not leave the den where they have been littered, till they are six weeks or two months old. It is not, however, till they are about ten or twelve months old, and till they have shed their first teeth and completed the new, that the dam thinks them in a capacity to shift for themselves. Then, when they have acquired arms from Nature, and have learned industry and courage from her example, she declines all future care of them, being again engaged in bringing up a new progeny. These animals require two or three years for their growth, and live to the age of fifteen or twenty.

The wolf grows grey as he grows old, and his teeth wear, like those of most other animals, by using. He sleeps when his belly is full, or when he is fatigued, rather by day than night, and is always very easily waked. He drinks frequently; and in times of drought, when there is no water to be found in the trunks of old trees, or in the pools about the forest, he comes often, in the day, down to brooks, or lakes in the plain. Although very voracious, he yet supports hunger for a long time, and often lives four or five days without food, provided he is supplied with water.

The wolf has great strength, particularly in his fore-parts, in the muscles of his neck and jaws. He carries off a sheep in his mouth without letting it touch the ground, and runs with it much swifter than the shepherds who pursue him, so that nothing but the dogs can overtake, or oblige him to quit his prey. He bites cruelly, and always with greater vehemence in proportion as he is less resisted; for he uses precautions with such animals as attempt to stand upon the defensive. He is cowardly, and never fights but when under a necessity of satisfying his hunger, or of making good his retreat. When he is wounded by a bullet, he is heard to cry out; and yet, when surrounded by the peasants, and attacked with clubs, he never howls, but defends himself in silence, and dies as hard as he lived.

If he happens to be caught in a pit-fall, he is for some time so frightened and astonished, that he may be killed without offering to resist, or taken alive without much danger. At that instant, one may clap a collar round his neck, muzzle him, and drag him along, without his ever giving the least signs of anger or resentment. At all other times he has his senses in great perfection. He smells a carcass at the distance of more than a league; he also perceives living animals a great way off, and follows them a long time upon the scent. Whenever he leaves the wood, he always takes care to go out against the wind. When just come to its extremity, he stops to examine, by his smell, on all sides, the emanations that may come either from his enemy or his prey, which he very nicely distinguishes. He prefers those animals which he kills himself to those he finds dead; and yet he does not disdain these, though ever so much intected, when no better is to be had. He is particularly fond of human flesh; and, perhaps, if he was sufficiently powerful, he would eat no other. Wolves have been seen following armies, and arriving in numbers upon the field of battle, where they devour such dead bodies as were left upon the field, or but negligently interred. These, when once accustomed to human flesh, ever after seek particularly to attack mankind, choose to fall upon the shepherd rather than his flock, and devour women, carry off their children, &c. These dreadful wolves are called *ware wolves*, that is to say, wolves of which we ought to be *aware*.

The colour of this animal differs according to the different climates in which he is bred, and often changes even in the same country. Besides the common wolves which

are found in France and Germany, there are others with thicker hair, inclining to yellow. In the northern climates, some are found quite black, and some white all over. The former are larger and stronger than those of any other kind.

THE FOX. This animal has always been famous for his artifices: and the reputation he has thus acquired, he partly merits. What the wolf cannot accomplish but by his superior strength, the fox accomplishes by his superior cunning. Without attempting to oppose either the shepherd, his dog, or his flock, he finds an easier way to subsist. Patient and prudent, he waits the opportunity for depredation, and varies his conduct as he perceives that circumstances vary; and though as indefatigable as the wolf, and more nimble than that animal, he yet does not trust entirely to the swiftness of his course, but contrives for himself an asylum, to which he retires in cases of necessity, and in which, sheltered from danger, he brings up his young.

The fox generally fixes his residence at the edge of a wood, and yet not far removed from some cottage, or some hamlet. He listens to the crowing of the cock, and the cackling of other domestic fowls: even at a considerable distance he scents them, and seizes his opportunity. If he be able to get into the yard, he begins by levelling all the poultry without remorse. This done he carries off a part of the spoil, hides it at some convenient distance, and again returns to the charge. Taking off another fowl in the same manner, he hides that also, though not in the same place; and this method he practises for several times together, till, warned by the approach of day, or the noise of the family, he finally retires. The same arts are observed when he finds birds entangled in springes laid for them by the fowler; with whom the fox taking care to be beforehand, very expertly snatches the birds out of the snare, conceals them in different places, leaves them there sometimes for two or three days, and is never at a loss to recover his hidden treasure. He is equally alert in seizing the young hares and rabbits, before they have strength enough to escape him; and when the old ones are wounded and fatigued, he is sure to come upon them in the moments of distress, and to shew them no mercy. In the same manner he finds out the nests of the partridge and the quail, and seizes the mother while sitting.

The fox is so voracious, that, when deficient of better food, he devours rats, mice, lizards, toads, and serpents. Insects and shell-fish he is likewise sometimes known to eat. In vain does the hedge-hog roll itself up into a ball to oppose him: this determined glutton seizes it till it is obliged to appear uncovered, and then devours it. The wasp and the wild bee are attacked by him with equal success. Though at first they fly out upon their invader, and actually oblige him to retire, yet this repulse is but for a few minutes, till he has rolled himself upon the ground, and thus crushed such as may have stuck to his skin: he then returns to the charge, and at length, by dint of perseverance, obliges them to abandon their combs, which he greedily devours, both wax and honey.

The young foxes are born blind, like dogs; like them, too, they are eighteen months or two years in coming to perfection, and live about thirteen or fourteen years. The senses of the fox are as good as those of the wolf; his sentiment is more acute, and the organ of his voice is more supple, and more perfect. The wolf is never heard but by dreadful howls, while the fox only yelps, barks, and sends forth a moanful sound, resembling the cry of the peacock. His tones, too, are different, according to the different sentiments with which he is affected. He has one sound expressive of desire, another of murmur, another of sorrow, and another of pain: the latter is never heard from him, unless in the instant that he is wounded by a shot, and has lost the use of some member; for like the wolf when attacked with cudgels alone, he never murmurs, but will defend himself with obstinacy, and fight in silence to the last gasp. He bites dangerously, and with such determined fury, that, in order to make him relinquish his hold, ponderous wood, and even iron bars, are necessary to be forced between his jaws.

The flesh of the fox is not so bad as the flesh of the wolf. Dogs, and even men, eat it in autumn, especially if the animal has fed on grapes; and, in winter, good furs are made of his skin. He sleeps so sound, that, however closely approached, there is no great danger of awaking him. When he only means to rest himself, he stretches out his hind legs, and remains flat upon his belly. In this posture he watches for the birds as they perch on the hedges; who no sooner perceive him than they give each other warning of their approaching danger. The jackdaw and the magpie, in particular, often follow him along to the distance of some hundred paces, still towering beyond his

reach, and with their cries, and notes of hostility, apprise other animals to beware.

Of all wild animals, the fox is most subjected to the influence of climate; and there are found nearly as many varieties in this species, as in that of any domestic animal. The generality of foxes in this climate are red; of some, however, the hair is of a greyish cast; and, of all, the tip of the tail is white. In the northern countries we find foxes of all colours.

THE BADGER is a lazy, distrustful, solitary animal that retires far from the approach of man, and digs a subterraneous residence, where it spends, at least, three-fourths of its existence, and never ventures forth but in search of food. It burrows in the ground with particular facility, as its body is rather of an oblong form, and its claws, those especially of the fore feet, are very long and compact. The hole which it thus forms often proceeds to a great depth below the surface of the earth, and the passage to it is always oblique and winding.

The fox, who is less expert at such excavations, often appropriates to his own convenience the labours of the badger.

Unable to compel him from his retreat by force, it often drives him from it by stratagem, often remains a fixed sentinel at the mouth of the passage, disturbs it, and, as an infallible expedient, it is said, emits his ordure. The badger gone, he immediately assumes possession of it, enlarges it, and every way accommodates it to his own purpose. Though forced to remove to another habitation, this animal does not, however, remove to another country. At a little distance from its old burrow, it forms a new one, from which it never stirs but at night. The dogs easily overtake it, when it is at any distance from its hole, and then, using all its strength, all its powers of resistance, it throws itself upon its back, and defends itself with desperate resolution.

The young badgers are easily tamed; they will play with young dogs, and like them, will follow any person whom they know, and from whom they receive their food; but the old ones, in spite of every effort, still remain wild. They are neither mischievous nor voracious, as the fox and the wolf are, yet they are carnivorous; and though raw meat is their favourite food, yet they will eat any thing that comes in their way, as flesh, eggs, cheese, butter, bread, fish, fruit, nuts, roots, &c. They sleep the greatest part of their time, without, however, being subject, like the moun-



tain-rat, or the dor-mouse, to a torpor during the winter : and thus it is, that, though they feed moderately, they yet are always fat.

Their hole they keep exceedingly clean, nor are they ever known to void their ordure in it. The male is rarely to be found with the female. In summer she brings forth, and her usual number at a birth is three or four. These she feeds at first with her milk, and afterwards with such petty prey as she can surprise. She seizes young rabbits in the warren, robs birds of their young, while yet in the nest, finds out where the wild bees have laid up their honey, where field-mice, lizards, serpents, and grasshoppers, are to be met with ; and carries all to her expecting brood, which she frequently brings toward to the mouth of her hole.

These animals are naturally of a chilly temperament. Such as are reared in a house seem to be never more happy than when near a fire. They are likewise very subject to the mange ; and, unless carefully washed, the dogs that penetrate into their burrows are seized with the same distemper.

The hair of the badger is always filthy ; between the anus and the tail there is an opening, which, though it has no communication with any interior part, and is hardly an inch deep, continually emits an oily liquid. This the animal is fond of sucking. Its flesh is not absolutely nauseous : and of its skin are made coarse furs, collars for dogs, trappings for horses, &c.

THE OTTER is a voracious animal which, more fond of fish than of flesh, is seldom found but at the sides of lakes and rivers. It swims with more facility than even the beaver. All the feet of the otter have membranes ; and it can hardly walk faster than it swims.

Accurately considered, the otter cannot be pronounced an amphibious animal. We even find them drowned when they happen to have been entangled in a net ; and this evidently for want of having had time to destroy it, and thereby effect their escape. For want of fish, frogs, water-rats, or other nourishment, it will eat the young branches, and the bark, of aquatic trees ; and in spring it will eat new grass. Of cold it is as little afraid as of moisture. It brings forth in the month of March. Three or four is the number generally produced at a birth.

* The otter becomes industrious with age, at least enough so to wage a successful war against the tribes of fishes, which, with respect to instinct and sentiment, are greatly inferior to other animals. It does not dig its own habitation, but fixes its residence in the first hole that offers, under the root of the willow or poplar-tree, in the clefts of rocks, and even among piles of floating wood ; and there the female brings forth her young. It, however, frequently changes its residence ; and drives away, or disperses its young ones at the expiration of six weeks, or two months.

THE MARTIN.] The generality of naturalists have considered the martin and the pine-weasel as animals of one and the same species. They are, however, different both in disposition and temperament. The pine-weasel shuns open countries, confines itself to the bosom of the forest, fixes its residence upon some tree, and is never found in great numbers but in cold climates ; while the martin not only approaches human habitations, but even forms a residence for itself in old buildings, in hay-lofts, in holes of walls, and while the species is generally diffused in great numbers over all the temperate climates, it is not to be met with in the regions of the North.

The countenance of the martin is very sharp ; its eye is lively, its limbs are supple, its body is flexible, and all its movements are quick. It rather leaps and bounds, than walks ; and with great facility climbs walls, enters pigeon-houses, and hen-houses, devours the eggs, the pigeons, and the hens, as on other occasions it does mice, rats, moles, and birds in their nests.

This animal, it is said, brings forth as often as the cat. The growth of the young ones is very quick ; and hence it may be inferred, that it is an animal whose life does not exceed eight or ten years. Its smell, which is not absolutely disagreeable, is like that of counterfeit musk. Both the martin and the pine-weasel, as well as a number of other animals, have interior vesicles which contain a strong-scented substance like that which the civet furnishes.

THE PINE-WEASEL, originally a native of the North, is in a manner peculiar to that climate, where they are so numerous, that the quantity of furs produced from this ani-

mal alone, and carried into foreign countries, is actually astonishing. In temperate climates, on the contrary, it is rarely, and, in warm climates never, to be found. Some there are in Burgundy, and some in the forest of Fontainebleau; but in general they are as scarce in France as the martin is common. England, having no extensive woods, is unacquainted with this animal.

Alike averse to open countries, and to countries which are inhabited, it remains in the bosom of some forest, ranges below through the labyrinths of the thicket, or towers aloft upon the branches of trees. It subsists by the chase, and destroys a prodigious quantity of birds, whose nests it searches for, and invades, in order to devour the eggs. Of the squirrel, the dormouse, &c. it also makes a prey; and it is known to eat honey as well as the martin.

Its neck is yellow, whereas that of the martin is white; and its hair, at the same time, is much finer, thicker, and less subject to shed.

When the female is near her time, her custom is to climb to the nest of some squirrel, to drive her from it, to enlarge it for her own purpose, and to bring forth her young in it. In the same manner, she occupies the old nests of the owl and the buzzard, as also the hollow places of trees, from which she presently dislodges the woodpecker, and other birds.

THE POLE-CAT is somewhat smaller than the martin; its tail is shorter, its snout sharper, and its hair thicker and more black. It has some white on its forehead, and about the nose and mouth. It differs likewise in its voice; the cry of the martin being rather sharp and loud, that of the pole-cat deeper and more hollow. The pole-cat, however, does not at all resemble the martin in smell, which, in the former, far from being in any degree agreeable, is to the last degree fetid. When heated or enraged especially, it sends forth and diffuses a stench that is absolutely intolerable. The dogs will not eat its flesh; and even its skin, though good in itself, sells at a very low price, as it can never be entirely divested of its natural odour.

THE FERRET. It has been doubted by some authors, whether or not the ferret and the pole-cat were animals of two different species. Perhaps, the resemblance there sometimes is in the colour of their hair first gave rise to this uncertainty. The pole-cat, nevertheless, a native of

temperate climates, is an animal wild like the martin ; whereas the ferret, originally an inhabitant of hot countries, can only exist in our climate as a domestic animal. The ferret also, and not the pole-cat, is made choice of to drive the rabbits from their burrows, chiefly because it is more easily tamed. The ferret has a longer and thinner body, narrower head, and a sharper snout, than the pole-cat. It has not the same sagacity in providing for its subsistence ; it cannot exist, at least in our regions, without the care of man, nor have such of the species as have been lost in the burrows of rabbits, been ever known to multiply in the country ; but have, on the contrary, perished, to all appearance, by the severity of the winter.

This animal is by nature a mortal enemy to the rabbit. If even a dead one is presented to a young ferret which had never seen one before, it springs at it, and tears it with fury ; if it be a living one, it seizes it by the neck and nose, and instantly begins to suck its blood. When the ferret is let loose into the burrows of the rabbits, it is necessary to muzzle him, that he may not kill them at the bottom, but only oblige them to run out, and thereby fall into the net laid for them at the entry. If he is allowed to go unmuzzled, there is a risk of losing him, because, after having sucked the blood of the rabbit, he will fall asleep ; and the smoke which is raised at the mouth of the burrow does not always prove a sufficient expedient for bringing him back, as there are often more issues than one, and as one burrow generally communicates with others, in which the ferret is apt to be the more bewildered, the more he is surrounded with the smoke.

THE WEASEL. The common weasel is as frequent in temperate and in hot countries, as it is scarce in cold ones. Though of the same species, it is in many respects different from the ermine, which is a native of the north.

When a weasel enters a hen-roost, it never meddles with the cocks or the old hens ; it makes choice of the pullets, the young chickens, and these it kills with a single stroke on the head, and carries away one after another. The eggs it sucks with incredible avidity. In winter it generally resides in some granary, or hay-loft ; where the female often continues even in the spring, in order to bring forth her young among the hay or straw. During this time the weasel makes war with the rats and mice with more success than the cat, since, following them into all their holes, it

is next to an impossibility for them to escape. It also climbs up to the pigeon-houses, to the nests of sparrows, &c. and commits great havock. In summer, it removes to some distance from the houses, always choosing the lower countries about the mills and streams, hiding itself among the bushes, in order to catch the birds, and not unfrequently taking up its habitation in the hollow of an old willow. The female generally brings forth four or five. The young ones come forth with their eyes shut, but in a little time they attain a sufficiency of growth and strength to follow their mother to the chace. They attack adders, water-rats, moles, field-mice, &c. ; and, traversing the meadows, devour quails and their eggs.

Like the pole-cat and the ferret, these animals have so strong a scent that they cannot be kept in any place that is inhabited. As their own smell is very bad, they seem to sustain no inconvenience from any foreign stench or infection. A peasant in my neighbourhood took, one day, three weasels newly brought forth, in the carcase of a wolf which had been suspended by its hind legs from one of the branches of a tree ; and though the wolf was almost entirely rotten, the old weasel, nevertheless, brought grass, straw, and leaves, in order to make a bed for her young ones in the cavity of the thorax.

THE ERMINE, or STOAT. The weasel with a black tail, is called the ermine when it is white, and the stoat when it is red or yellowish. Though it is a less common animal than the weasel, yet there are numbers to be found in the old forests, and sometimes during the winter in the neighbourhood of woody grounds. It is always easy to distinguish it from the common weasel, because the tip of its tail is always of a deep black, while the edge of its ears, and the extremities of its feet are white.

CHAP. XII.

Of certain smaller Animals of the carnivorous Class—The Squirrel—The Rat—The Mouse—The long-tailed Field-Mouse—The Water-Rat—The short-tailed Field-Mouse—The Guinea-Pig—The Hedge-Hog—The Shrew-Mouse—The Water-Shrew-Mouse—The Mole—The Bat—The Fat Squirrel—The Garden-Squirrel, or greater Dormouse—The Dormouse—The brown Rat—The Marmot.

THE SQUIRREL is a beautiful little animal, which is only half-wild, and which, by its gentleness, its docility, and even the innocence of its manners, might deserve to be exempted from the present class. It is neither properly a carnivorous nor an injurious animal, though it sometimes seizes on birds; its general food consisting of fruit, almonds, hazle-nuts, beech-mast, and acorns: it is neat, cleanly, alert, lively, and industrious; its eyes are full of fire, its countenance is sharp, its body is nervous, and its limbs are supple.

The beauty of its form is yet heightened by a spreading tail, in shape like a plume of feathers, which it raises above its head, and forms into a kind of shade for itself.

The squirrel may be said to be less a quadruped than almost any other four-footed animal. It generally holds itself almost upright, using its fore-feet as hands for a conveyance to its mouth. Instead of hiding itself in the earth, it is continually in the air: it somewhat resembles the birds by its lightness and activity; like them, it rests upon the branches of trees; leaping from one to the other, and in the highest of them builds its nest. It avoids the water still more than the earth; and it is even asserted of this animal, that, when it is obliged to cross a river or stream, it uses the bark of a tree, or some such light woody substance, as a boat while its tail supplies the place of sails, and of a rudder. It gathers together a quantity of nuts during the summer, which it deposits in the hollow part of some old tree, and to these has recourse for provision in winter; and such is the agility of its body, that it will, in an instant, climb a beech tree, let its bark be ever so smooth.

There are many species which approach to that of the squirrel, though there are few varieties in the species itself. Some there are of an ash-colour, and all the others are red. The small grey squirrel is of a different species, and remains always grey: and, without mentioning the flying squirrels,



which are very different from the others ; the white squirrel of Cambaye, which is very small, and has a tail like that of the European squirrel ; that of Madagascar, called *Tsitsihi*, which is grey, and which, as Flaccourt says, is neither handsome nor fit to be tamed ; the white squirrel of Siam ; the grey, and spotted squirrel of Bengal ; the streaked squirrel of Canada ; the black squirrel ; the large grey Virginian squirrel ; the white-striped squirrel of New Spain ; the white Siberian squirrel ; the variegated squirrel ; the little American squirrel ; that of Brasil ; that of Barbary ; the *palmist*, &c. form so many species entirely distinct and separate from that of which we have been treating.

THE LONG-TAILED SQUIRREL is about three times the size of the common squirrel. It is of a blackish colour, and is a native of Ceylon and Malabar.

THE RAT.] If we descend by degrees from the great to the small, from the strong to the weak, we shall find, that Nature has uniformly maintained a balance ; that, attentive only to the preservation of each species, she creates a profusion of individuals, and is supported by the numbers which she has formed of a diminutive size, and to which she has denied weapons, strength, and courage.

Under the general name of rat, several species of small animals have been comprised. The first of these, known in England by the name of the *black rat*, is carnivorous, and even, if the expression is allowable, *omnivorous*. Hard substances, however, it prefers to soft ones : it devours wool, stuffs, and furniture of all sorts ; eats through wood, makes hiding places in walls, thence issues in search of prey, and frequently returns with as much as it is able to drag along with it, forming, especially when it has young ones to provide for, a magazine of the whole. The females bring forth several times in the year, though mostly in the summer season ; and they usually produce five or six at a birth.

In defiance of the cats, and notwithstanding the poison, the traps, and every other method that is used to destroy these creatures, they multiply so fast as frequently to do considerable damage. In old houses, in the country especially, where great quantities of corn are kept, and where the neighbouring barns and hay-stacks favour their retreat, as well as their multiplication, they are often so numerous, that the inhabitants would be obliged to remove with their furniture, were they not to devour each other. This we have often, by experience, found to be the case when they

have been in any degree straitened for provisions ; and the method they take to lessen their numbers, is for the stronger to fall upon the weaker. This done, they lay open their skulls, and first eat up the brains, afterwards the rest of their body. The next day hostilities are renewed in the same manner ; nor do they suspend their havock till the majority are destroyed. For this reason it is, that, after any place has for a long while been infested with rats, they often seem to disappear of a sudden, and sometimes for a considerable time.

The female always prepares a bed for her young, and provides them immediately with food. On their first quitting the hole, she watches over, defends, and will even fight the cats, in order to save them. The weasel, though a smaller animal, is, however, a still more formidable enemy than the cat. The rat cannot inflict any wounds but by snatches, and with its fore-teeth, which, however, being rather calculated for gnawing than for biting, have but little strength ; whereas the weasel bites fiercely with the force of its whole jaw at once, and, instead of letting go its hold, sucks the blood through the wound. In every conflict with an enemy so dangerous, it is no wonder, therefore, that the rat should fall a victim.

There are many varieties in this species. The white rat, like the white mouse, the white rabbit, and all other animals which are entirely of that colour, has red eyes. The white species, with all its varieties, appears to belong to the temperate climates of our continent, and have been diffused in much greater abundance over hot countries than cold ones. Originally they had no rats in America ; and those which are to be found there in such numbers at this day, are the produce of rats which accidentally obtained a footing on the other side of the Atlantic with the first European settlers. Of these the increase was so great, that the rat was long considered as the pest of the colonies ; where, indeed, it had hardly an enemy to oppose it but the large adder, which swallows it up alive. The European ships have likewise carried these animals to the East Indies, into all the islands of the Indian Archipelago, as well as into Africa, where they are found in great numbers. In the North, on the contrary, they have hardly multiplied beyond Sweden ; and those which are called Norwegian and Lapland rats, are animals different from ours.

THE MOUSE is an animal smaller than the rat, as also more numerous, and more generally diffused. Its instinct,

its temperament, its disposition, is the same; nor does it materially differ from the rat, but by its weakness, and the habits which it contracts from that circumstance. By nature timid, by necessity familiar, its *fears* and its wants are the sole springs of its actions. It never leaves its hiding-place but to seek for food; nor does it, like the rat, go from one house to another, unless forced to it, or commit by any means so much mischief. Its manners are milder; and, to a certain degree, it may be tamed. It is, however, utterly incapable of attachment; and, in fact, how is it possible to love those who are perpetually laying snares for us?

But for its immense fecundity, the species of the mouse could not subsist. Even in mouse traps they have been known to bring forth. They produce at all seasons, and several times in the year. Their usual number at a birth is five or six; and these, in less than fifteen days, attain growth and strength sufficient to run about and shift for themselves. As in these respects they so soon attain perfection, so the duration of their life must be very short; a circumstance which cannot but heighten our idea of their prodigious multiplication. Aristotle tells us, that, having put a pregnant mouse into a vessel of corn, he soon after found in it no less than one hundred and twenty mice, all sprung from one original.

THE LONG-TAILED FIELD-MOUSE is smaller than the rat, but larger than the common mouse, and does not live in houses. It is remarkable for the largeness and prominence of its eyes; it differs likewise both from the rat and the mouse in the colour of its skin, which, while it is tolerably white under the belly, is of a reddish brown upon the back. The species is generally and abundantly diffused.

It appears, that they are a long time in attaining their full growth, as they vary considerably in size. The largest are rather more than four inches in length, from the tip of the nose to the insertion of the tail; and the smallest, which appear to be full grown as well as the others, are an inch shorter. As there are found many of different intermediate sizes, however, there is no room to doubt but that the larger and the smaller are all of the same species.

These creatures are fond of dry and elevated grounds: In woods, and in the fields adjoining to them, they are to be found in great numbers. They conceal themselves in holes, which they either find already made, or which they make

for themselves, under bushes, or the trunks of hollow trees. In these they amass so prodigious a quantity of acorns, nuts, &c. that in one single hole there has been found a bushel at a time; and this provision, instead of being proportioned to the wants of the animal, is only so to the capacity of the place allotted for its reception. These holes are generally more than a foot under ground, and often divided into two cells, of which the one serves for an habitation for itself and its young ones, and the other for a granary. The only method of preventing their ravages, which appeared effectual, was that of setting traps at every tenth pace through the whole extent of each piece of new-sown land. There wants no other bait than a roasted nut laid under a flat stone, which is to be supported by a small bit of wood. This they will eagerly attempt to seize; and, being fixed to the wood, no sooner do they touch it than the stone falls upon them, and stifles or crushes them to death.

THE WATER-RAT is a little animal, about the size of the black rat, but in its nature and habits, rather resembling the otter than the rat. Like the otter, it frequents the fresh waters, and is generally found on the borders of rivers, rivulets, and ponds; like that creature, too, it seldom feeds but upon fish, or the spawn of fish, though sometimes it eats frogs, water-insects, and even roots and herbs. This animal is not web-footed; but, though every toe of its feet is separated, it swims with facility, keeps itself a long time above water, and thence carries off its prey, in order to eat it when got to land, either on the grass, or in its hole.

The head of the water-rat is shorter, the nose broader, the hair more exact, and the tail much longer than that of the land-rat. Like the otter, it flies from the large rivers, or rather from those which are too much frequented, and is never found either in houses or in barns.

It is probable, that these animals bring forth often in a year; but of this we have no certain information. Their flesh is not absolutely bad; and, in Catholic countries, the peasants eat it during the Lent, as they do that of the otter. The species is to be found throughout Europe, the very extremities of the North excepted.

THE SHORT-TAILED FIELD-MOUSE is still more common, more generally diffused than the long-tailed kind, and is found almost every where; in woods, in meadows,

and even in gardens. It is remarkable for the thickness of its head, and the shortness of its tail, which is not above an inch in length. It forms holes in the earth, where it hoards up corn, nuts, and acorns; though the former of these it seems to prefer to every other kind of aliment. About the month of July, when the corn begins to ripen, they flock together from all sides, and frequently do great damage, by cutting the stalk, in order to come at the ear. In autumn and winter, the greater part of them withdraw into the woods, where they find beech-mast, nuts, and acorns. Some years they appear in such great numbers, that they would destroy every thing, were they to subsist for any length of time. For want of other food, however, they often destroy and eat one another, and are themselves the usual prey of the fox, the wild-cat, the martin, the weasel, and of the long-tailed field-mouse.

THE GUINEA-PIG, though originally a native of the warm climates of Brazil and Guinea, lives, however, and breeds in temperate and even cold countries, provided it is properly taken care of. Its skin is of little or no value; and the flesh, though people may, and actually do eat it, is very indifferent food; a circumstance which might, in some measure, be removed, were they to be reared in warrens, where they might have air, space to range in, and a proper choice of herbs. Those which are kept in houses have nearly the same taste as the house-rabbit; and of those which have passed the summer in a garden, the taste is less disagreeable, but is still insipid.

The growth of these animals is not entirely completed till the expiration of eight or nine months; though indeed it is in apparent bulk and fat that they chiefly increase till then, the development of the solid parts being finished before the age of five or six months. The female never goes with young above three weeks; and she has been known to bring forth when only two months old. The first litter is not so numerous as the subsequent litters. It does not amount to more than four or five; the second amounts to five or six, and the rest to seven or eight, and even to ten or eleven. She does not suckle her young longer than twelve or fifteen days. Thus these animals produce at least every two months; and as those which are newly born produce in the same manner, their multiplication is astonishing. In one year a thousand might be obtained from a single couple, did they not frequently destroy each other, and perish from the cold and wet.

The Guinea-pig feeds on all sorts of herbs, and especially on parsley, which it prefers even to bran, flour, or bread. Of apples and other fruits it is also exceedingly fond. Like the rabbit, it eats precipitately, little at a time, but very often. It whines somewhat like a young pig.

These animals are so delicate, that it is with difficulty they undergo the rigours of winter. When they feel the cold, they assemble together, press close to one another, and in this situation are frequently found dead.

THE HEDGE-HOG has the power of defending itself from an enemy without combating him, and of annoying without attacking him. Possessed of little strength, and of no agility, by which it might escape its foes, it has received from Nature a prickly armour, with a facility of rolling itself up in a ball, and of presenting from every part of its body a poignant weapon of defence. Even from its fear this animal obtains another engine of security; the smell of its urine, which, when attacked, it generally sheds, being sufficient to disgust its enemy with the contest, and to keep him at a distance. Thus the generality of dogs are content with barking at the hedgehog, when it falls in their way, without discovering any inclination to seize it. Of these however, there are some which, like the fox, have had the address to master it, though of the martin, the polecat, the ferret, the weasel, or any of the birds of prey, it has no dread.

When at large in the country, they are generally found in woods, under the trunks of old trees, as also in the clefts of rocks. I do not believe that they climb up trees, as some naturalists have affirmed, or that they make use of their prickles to carry off the fruit; it is with their mouth they seize it; and though they are very numerous in our forests, yet I have never seen one of them upon a tree. They always remain at the foot, in some hollow space, or under moss. They remain in a state of inactivity all day; they only venture abroad by night, and seldom approach human habitations. They sleep during the winter; and therefore every thing that has been said of their laying up provisions for that season must be false. They at no time eat much, and can subsist very long without any food whatever. Like that of all other animals which become torpid in winter, their flesh is not proper for food; nor is their skin any longer converted to the smallest use.

The SHREW-MOUSE seems to form a shade in the order



of small animals, and to fill up the vacuum between the rat and the mole. The shrew-mouse is smaller still than the domestic mouse, resembles the mole in its snout, which is longer than its jaw-bones; in its eyes, which, though rather larger than those of the mole, are, however, in like manner concealed, and much smaller than those of the domestic mouse; in the number of its claws, of which it has five to each foot; in its tail, and its legs, particularly those behind, which are shorter than those of the domestic mouse; and lastly, in its ears, and in its teeth.

This diminutive creature has a strong smell, which is peculiar to itself, and so offensive to cats, that, though they will cheerfully chase and kill the shrew-mouse, they yet will not eat its flesh like that of the domestic mouse. It is evidently this noisome odour, this aversion of the cat to it, that gave rise to the notion, that the shrew-mouse is a venomous animal, and that its bite is so dangerous to cattle of all sorts, and particularly to horses. The truth, however, is, that it is neither venomous nor capable of biting; for it cannot open its mouth sufficiently wide to seize the double thickness of the skin, which is absolutely necessary, in order to bite. The distemper among horses, it is farther to be observed, which the vulgar attribute to the tooth of the shrew-mouse, is a swelling which proceeds from an internal cause, and has no connection with any bite, or rather scratch, that this little animal may give.

In winter especially, the shrew-mouse generally fixes its residence in some hay-loft, stable, or barn, where it feeds on grain, insects, and putrefied flesh. It is likewise found in woods and fields, where, living on corn, it sometimes conceals itself under moss or leaves, sometimes under the trunks of trees, sometimes in holes abandoned by moles, and sometimes in holes of a smaller size, which it forms for itself by digging with its claws and snout.

The shrew-mouse produces, it is said, as many at a birth as the domestic mouse, though less frequently. It has a squeak much more sharp and piercing than the latter. In point of nimbleness, however, it is far inferior; and as it both sees imperfectly, and runs slowly, there is little difficulty in taking it.

The usual colour of these creatures is brown, with a mixture of red; others of them are ash-coloured; and in all there is a greater or less degree of whiteness upon the belly. They are very common throughout Europe; but they do not seem to have obtained a footing in America.

THE WATER SHREW-MOUSE, though a native of these regions, was yet unknown to any of our naturalists till M. Daubenton first discovered it. Every thing necessary to be added here, with respect to the *water shrew-mouse*, is, that it is taken at the sources of fountains, in the morning and evening, as the sun rises and sets; that in the day-time it remains concealed in the clefts of rocks, or in holes under ground near the edges of rivulets; that it brings forth in spring, and commonly produces nine young ones at a time.

THE MOLE, without being blind, has such small eyes, and these so concealed, that it can make little use of the sense of seeing. In recompence, however, it enjoys the senses of hearing and feeling in an eminent degree. Its skin is soft as silk; and its little paws, which are furnished with five claws, are very different from those of other animals, and almost like the hands of a human being. Proportioned to the size of its body, its strength is great; it possesses the mild habitudes of repose and of solitude; the art of securing itself, of forming, instantaneously, as it were, an asylum to itself, or extending it, and of obtaining, without the necessity of relinquishing it, an abundant subsistence.

The mole shuts up the entry to its retreat, which it seldom deserts, unless forced to it by heavy rains in summer. It is fond of cultivated grounds, and is never to be found in those which are either muddy, hard, compact, or stony. It requires a soft soil, well supplied with esculent roots, and with insects and worms, of which, indeed, its principal nourishment consists.

As these animals very seldom come above ground, they have but few enemies; and very readily evade the pursuit of animals stronger and swifter than themselves. The chief calamity which befalls them is an inundation; and when this happens, they are seen in numbers attempting to save themselves by swimming, and using every effort to reach the higher grounds. The greatest part, however, perish, as well as their young, which remain in the holes behind. Were it not for such accidents, from their great fecundity, they would become extremely troublesome. They generally have four or five at a time; and it is easy to distinguish among other mole-hills, that in which the female has brought forth her young. These are made with much greater art than the rest; and are usually larger and more elevated. It is probable they produce oftener than once

a-year. Thus far indeed is certain, that new-born moles are found from the month of April to the month of August; a circumstance which, however, may be owing to their having been engendered and brought forth sooner or later in the year.

The hole in which they produce their young is formed with singular skill, and deserves a particular description. The female begins by erecting the earth into a tolerably spacious apartment, which is supported within by partitions at proper distance, that prevent the roof from falling. All round this she works, and beats the earth very firm, so as to make it capable of keeping out the rain, let it be ever so violent. As the hillock, in which the apartment is thus formed, is raised above ground, the apartment itself is consequently above the level of the plain, and therefore less subject to accidental slight inundations. The place being thus fitted, she procures grass and dry leaves, as a bed for her young. There they lie secure from wet, and she continues to make their retreat equally free from danger; for all round this hill of her own raising, are holes running into the earth, which go off from the middle apartment, like rays from a centre, and extend about fifteen feet in every direction. These resemble so many walks or chaces, into which the animal makes her subterraneous excursions, and supplies her young with such roots or insects as she can provide; but they contribute still more to the general safety; for as the mole is very quick of hearing, the instant she perceives her little habitation attacked, she takes to her burrow, and unless the earth be dug away by several men at once, she and her young always make good a retreat.

Some authors have said, but without foundation, that the mole and the badger sleep the whole winter. That this is not true of the badger, has been already observed; and as a proof that this animal quits its hole in winter as well as in summer, we have only to view the traces it leaves upon the snow. As for the mole, so far is it from sleeping during the winter, that it continues its subterranean operations then as well as in summer; and the peasants of France even proverbially remark, that "when moles are at work, a thaw is at hand." They are indeed fond of warm places; and the gardeners often catch them round their beds in the months of December, January, and February.

THE BAT. An animal, which, like the bat, is half-

quadruped and half-bird, and which, in fact, is neither the one nor the other, is a kind of monster. In the bat, the fore feet are, properly speaking, neither wings nor feet, though the animal uses them for the purpose of flying, and occasionally of moving along upon the ground. They are, in fact, two shapeless extremities, of which the bones are of a monstrous length, and connected by a membrane, uncovered with feathers, or even with hair, like the rest of the body : they are a kind of winged paws, or hands ten times larger than the feet, and, in all, four times longer than the whole length of the body of the animal : they are, in a word, parts which have rather the appearance of a capricious and accidental, than a regular and determined production.

To these incongruities, these disproportions of the body and members, may be added the still more striking deformities of the head. In some species, the nose is hardly visible, the eyes are sunk near the tip of the ear, and are confounded with the cheeks ; in others, the ears are as long as the body, or else the face is twisted into the form of a horse-shoe, and the nose covered with a kind of crust. Averse, likewise, to the society of all other creatures, they shun the light, inhabit none but dark and gloomy places, to which, after their nocturnal excursions, they are sure to return by break of day, and in which they remain, fixed, as it were, to the walls till night again approaches.

Their motion in the air is with less propriety to be termed a flight, than a kind of uncertain flutter, which they seem to execute by struggles, and in an awkward manner. They raise themselves from the ground with difficulty, never soar to a great height, and are but imperfectly qualified to accelerate, or even to direct, their flight. This, far from being either rapid, or very direct, is performed by hasty vibrations in an oblique and winding direction ; and in passing along they do not fail to seize all the gnats, moths, and other nocturnal insects that come in their way. These they swallow entire ; and in their excrements we meet with the remains of wings and the other dry parts, which they have not been able to digest. Like quadrupeds, the bat brings forth its young alive, and alike them it has teeth and nipples.

It is affirmed that these animals do not produce more than two at a birth, and that these they suckle, and even carry along with them as they fly. They unite in numbers to defend each other from the cold ; they pass the winter with-

out awaking, without stirring, and without eating, from the end of autumn till spring. Though they can more easily support hunger than cold, and can even subsist a number of days without food, they yet belong to the number of carnivorous animals; for, when opportunity serves, they will devour bacon and meat of all kinds, whether raw or roasted, whether fresh or corrupted.

THE FAT SQUIRREL. Of this kind of animal we know three species, which, like the marmot, sleep during the winter; namely, the fat squirrel, the garden squirrel, and the dormouse. Many authors have confounded these species together, though they are all three very different, and of consequence easily known and distinguished.

The fat squirrel is nearly of the size of the common squirrel, and like it, its tail is covered with long hair. It is without propriety that the term *sleep* has been applied to the state of these animals during the winter. They are not in a state of natural sleep at this period; they are in a torpor, which is produced by the coldness of the blood, and by which they lose the use of their members and senses. Their internal heat is indeed so small, that it hardly exceeds that of the temperature of the air. When the heat of the air is at ten degrees above the freezing point of the thermometer, the heat of these animals is also at ten degrees. Now it is well known, that the internal heat of man, and of the generality of animals exceeds at all times thirty degrees; and therefore there is little reason to wonder why these animals, so inferior to all others in point of heat, should become torpid as soon as their little quantity of internal heat ceases to be assisted by the external heat of the air; a circumstance which naturally happens when the thermometer is not more than ten or eleven degrees above congelation. This is the real cause of the torpor of these animals; a cause of which naturalists have not been apprised, and which, nevertheless, extends to all animals that sleep during the winter.

This torpor continues as long as the cause which produces it continues, and ceases when the cold ceases. A few degrees of heat above the tenth or eleventh degree are sufficient to re-animate these creatures; and if they are kept in a very warm place during the winter, they do not become torpid at all.

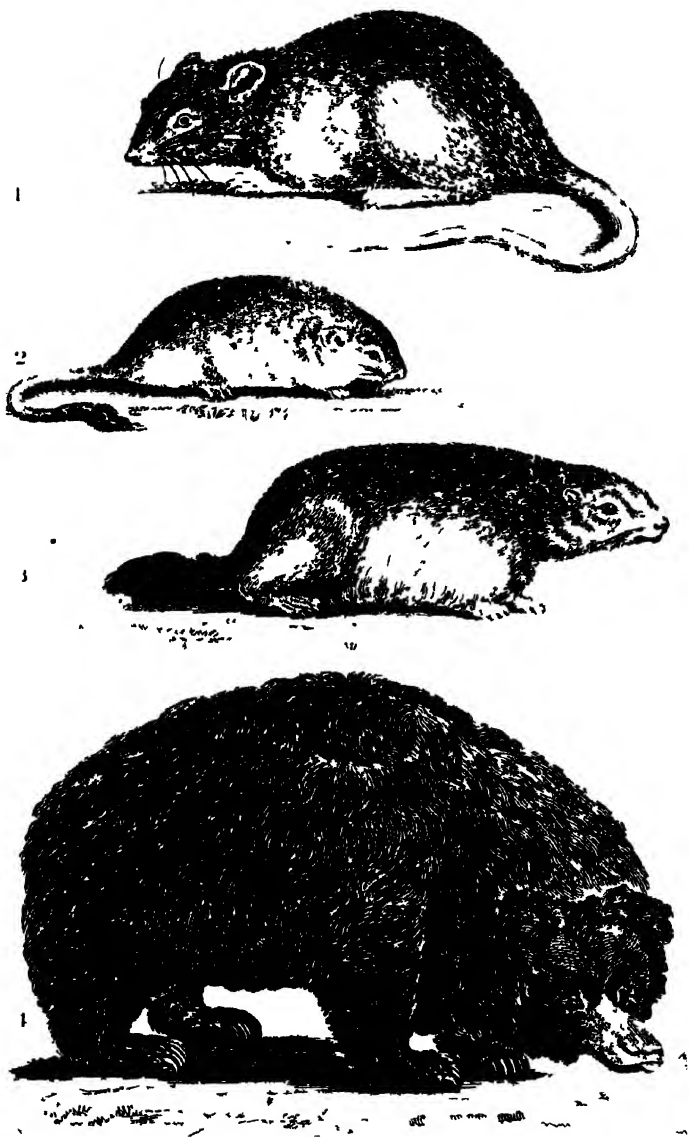
Though in this torpid state, they are without the smallest motion, though their eyes are shut and they seem to be deprived of all use of the senses, they yet feel pain when

it is very acute. This they testify by a movement of contraction, as also by a little hollow cry, which they even repeat several times. I am inclined to believe, that it is not from too great waste of substance that they sometimes perish in long winters, since in autumn they are excessively fat, and on their reviving in spring, they are found to have still remained so; this abundance of fat being an internal nourishment which is sufficient to support them, and to supply what they lose by perspiration.

The flesh of the fat squirrel is not unlike that of the guinea-pig. They were considered as a dainty by the Romans, who reared great numbers of them. Like the common squirrel, this animal lives in forests, climbs to the tops of trees, and leaps from branch to branch. This it does less nimbly indeed than the squirrel, whose legs are longer, whose belly is by no means so big, and which is remarkable for being meagre. Nuts, however, and other wild fruits, form its usual nourishment. It likewise eats little birds which it takes in the nests. It does not, like the squirrel, nestle in the upper parts of trees, but makes a bed of moss in the trunks of those which are hollow. It also shelters itself in the clefts of rocks, and always shews a preference for dry places. It avoids moisture, it drinks little, rarely descends to the ground, and, unlike the squirrel, which is easily tamed, remains always wild. The species is very generally diffused, but there are few or none of them in England.

THE GARDEN SQUIRREL, OR GREATER DORMOUSE.
The fat squirrel frequents the forests, and seems to shun our habitations; the garden squirrel, on the contrary, inhabits our gardens, and is sometimes to be found in our houses. The species of the latter is also more numerous, and more generally diffused.

These animals nestle in the holes of walls, climb up trees, choose the best fruits, and gnaw them as they begin to ripen. They climb up pear, apricot, and other trees; and in a scarcity of other fruit, they eat almonds, nuts, and even leguminous roots. These they carry in great quantities to their holes, where they make a bed of herbs, moss, and leaves. The cold stupefies, the heat revives them; and sometimes there are eight or ten found in one place, all in a state of torpor, all huddled together, and rolled up in a ball, in the midst of their hoard of provisions. Their flesh is not eatable, and has even the disagreeable smell of the house-rat.



1. Brown Rat . 2. Dormouse . 3. Marmot
 4. Animal of the Bear Species.

This animal is to be found in all the temperate climates of Europe, and even in Poland, and in Prussia ; but it does not appear that there are any in Sweden, or in any of the more northern countries.

THE DORMOUSE. Of all the rat species, the dormouse is the least ugly. Its eyes are sparkling, its tail is tufted, and its hair is rather fair than red. It never lives in houses, is seldom to be found in gardens, but chiefly frequents the woods, where it finds a shelter in the hollow of some old tree.

The species is by no means numerous, yet they seem to be tolerably common in Italy, and to be not unknown even in the northern climates ; but it does not appear to be an English animal ; for Ray, who had seen it in Italy, observes, that the small dormouse which is found in England, is not red upon the back, like the Italian, and that it probably belongs to another species.

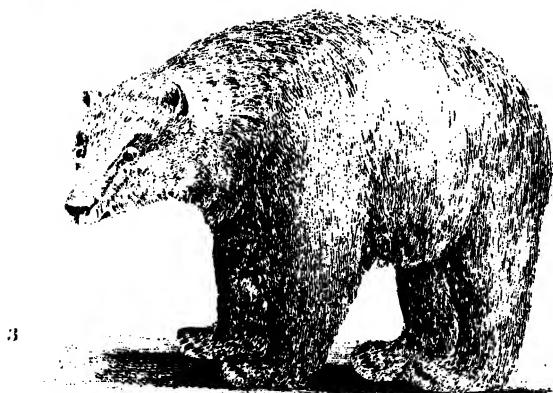
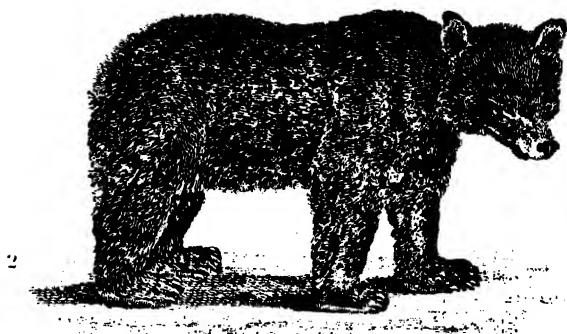
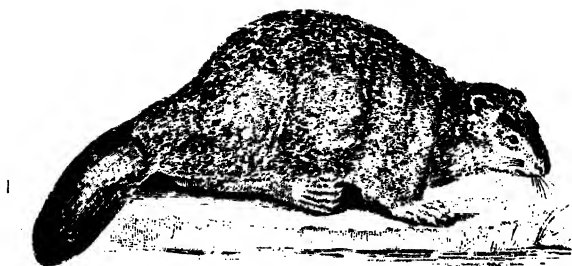
The dormouse becomes torpid by the cold, and rolls itself up in a ball ; it revives in mild weather, and hoards up nuts and other dry fruits for future sustenance. It forms its nest in trees, like the squirrel, though generally in a lower situation, among the branches of a nut tree, in a bush, &c. The nest is composed of herbs interwoven, is about six inches in diameter, has no aperture but at the top, and contains three or four young ones.

THE BROWN RAT is both stronger and more mischievous than the black rat ; it has a reddish skin, a long tail without hair, the back-bone arched like that of the squirrel, the body much thicker, and whiskers like those of a cat. It is considerably within half a century since that species has been spread in the neighbourhood of Paris.* They multiply indeed prodigiously, since it is well known that they generally produce twelve or fifteen, often sixteen, seventeen, eighteen, and even nineteen young ones at a time. The males are larger, stronger, and more mischievous than the females. When any one pursues, and endeavours to take them, they will turn again, and bite the hand or stick which touches them. Their bite is not only sharp but dangerous, and is immediately followed by a considerable swelling ; and the wound, though small, is yet long in being closed. They bring forth three times in a year, the dams

* It has not been known in England above 60 years, though now the most common (and in many parts the *only*) species of rat. Ed.

they proceed. Still more wonderful is the form of their hole; it resembles the letter Y, the two branches having each an opening that conducts into one channel, which terminates in their general apartment at the bottom. As the whole is contrived on the declivity of a mountain, there is no part of it on a level but the apartment at the end. One of the branches, or openings, issues out sloping downward; and this serves as a kind of sink, or drain, for the whole family, in which they void their excrements, and through which the moisture of the place finds an easy passage. The other branch, on the contrary, slopes upward, and serves them as a door to go in and out. The apartment at the end is warmly lined with moss and hay. It is even asserted, that this is a public work; that some cut the finest grass, others pile it up, and others take their turns to convey it to the hole. Upon this occasion, it is added, one of them lies upon its back, permits the hay to be heaped upon its belly, keeps its paws upright to make greater room, and in this manner, remaining still upon its back, is dragged by the tail, hay and all, to their common retreat. This practice some assign as a reason for the hair being generally worn away from their backs. However, another, and perhaps a better, reason may be given for this appearance; namely, their inhabiting cells under ground, and being constantly employed in digging up the earth. Whenever they venture abroad, one is placed as a centinel, sitting on an elevated rock, while the others amuse themselves in the fields below, or are employed in cutting grass, and making it into hay for their future convenience; and no sooner does their trusty centinel perceive a man, an eagle, a dog, or any other enemy, than he gives notice to the rest by a kind of whistle, and is himself the last that takes refuge in the cell.

They make no provision for the winter, foreseeing, probably, that such a precaution would be useless. But when they perceive the first approaches of the season in which their vital motions are to continue in some measure suspended, they labour very diligently to close up the apertures of their dwellings, which they effect with such solidity, that it is more easy to open the earth any where else, than where they have closed it. They are at that time very fat, and some of them are found to weigh twenty pounds. In this plight they continue for three months longer; but by degrees their flesh begins to waste, and they are quite thin by the end of winter. When their retreat is discovered, they are found each rolled into a ball, and



1. Beaver 2. Brown Bear 3. Greenland Bear.

covered with hay. In this state they seem entirely lifeless; they may be taken away, and even killed without their testifying any sense of pain: and those who find them in this manner, carry home the fat ones for food, and the young ones for breeding up and taming. The marmot produces but once a year, and the litter generally consists of three or four. Their growth is quick, and they live only nine or ten years. They are found in the Alps, Appenines, Pyrenees, in the highest mountains of Germany, in Poland, and in Canada, with a few variations.

CHAP. XIII.

Of carnivorous Animals continued—The Bear—The Beaver—The Racoon—The Coati—The Agouti.

THERE is no animal more generally known than the bear; and yet there is none concerning which more differences and contradictions have been found among the writers of natural history. These uncertainties have arisen from their not distinguishing properly the different species. The land bear must be distinguished from the sea bear, which is commonly known by the name of the white, or Greenland bear; and the land bears must again be divided into two species, the brown and the black. There are also white land bears found in Tartary, Russia, &c. which, though they resemble the sea bear in colour, differ from it, however, in every other particular. It is not the rigour of the climate that makes them white in winter, like the hares and ermines; they are brought forth white, and remain so all their lives. There are also found bears whose skins are a mixture of brown and black, which denotes an intermediate species between the white land bear, and the brown black bear.

We meet with the brown bear very frequently, and with the black bear very rarely, on the Alps. In the forests of the northern countries of Europe and America, on the contrary, the black bear is very common. The former is both fierce and carnivorous; the latter is only fierce, and constantly refuses to eat flesh.

The bear is not only a savage, but a solitary animal; he takes refuge in the most unfrequented parts, and the most dangerous precipices of uninhabited mountains. He chooses his den in the most gloomy parts of the forest, in some cavern that has been hollowed by time, or in the hollow of

some old enormous tree. Thither he retires alone, and passes a part of the winter without provisions, or without ever stirring abroad. He is not, however, entirely deprived of sensation, like the dormouse, or the marmot, but seems rather to subsist upon the exuberance of his former flesh, and only feels the calls of appetite when the fat he had acquired in summer begins to be considerably wasted.

When this happens, which, we are told, it generally does at the expiration of forty or fifty days, the male forsakes his den; but the female remains confined for four months: by which time she has brought forth her young. That the latter should not only be able to subsist, but even to nurse their offspring, without receiving themselves any food for such a length of time is highly improbable. When with young, however, it is allowed that they are exceedingly fat, as also, that, being covered with a very thick coat, sleeping the greatest part of their time, and giving themselves no exercise or motion, they must necessarily lose very little by perspiration.

Though the males of the brown species devour their new-born little ones, when they find an opportunity for it, yet the females seem, on the contrary, to love them with a ferocious distraction. When once they have brought forth, their fury is more violent, as well as more dangerous, than that of the males. Before the young leave the womb, their formation is perfect: and if either the *fœtus* of the bear, or the bear when newly born, appears at the first glance, unformed, it is merely because there is a want of proportion in the body and members even of the grown bear, and because, which is well known to be the case in all animals, the *fœtus*, or the new-born animal, is always more disproportioned than the grown animal.

The voice of the bear is a kind of growl, a harsh murmur, which, when enraged especially, is heightened by a clashing of the teeth. Highly susceptible of anger, that anger is always furious, and often capricious. However mild he may appear before his master, and even obedient when tamed, he ought still to be distrusted, still treated with circumspection; nor, on any account, must he be struck on the tip of the nose, or touched on the parts of generation.

This animal is capable of some degree of instruction. There are few who have not seen him stand on his hind legs, or with these dance in rude and awkward measure, to tunes either sung or played on an instrument. But, even in thus tutoring him, it is necessary, in order to succeed, that the animal should be taken young, and held in constraint ever

after. The bear which has passed his youth, is not to be tamed, nor even held in awe, and shews himself, if not actively intrepid, at least fearless of danger.

The wild bear turns not from his path, nor offers to shun the sight of man ; and yet, it is said, by a certain whistle he may be surprised, and so far charmed as to stop, and stand upon his hind feet. This is the time to shoot, or by one method or other to destroy him ; for, when only wounded in an attack, he darts with fury at his foe, and, clasping him with his fore-paws, is sure to stifle or strangle him, unless immediate assistance be given.

The bear enjoys the senses of seeing, hearing, and feeling, in great perfection ; and yet, compared with the size of his body, his eye is very small ; his ears are also short, his skin is coarse, and his hair very thick. His smell is exquisite ; more so, perhaps, than that of any other animal, the internal surface of his nose being very extensive, and excellently calculated to receive the impression of smells. He strikes with his paws as a man strikes with his fists ; but in whatever particulars he may bear a rude kind of resemblance to the human species, he is only rendered the more deformed by them ; nor do they give him the smallest superiority over other animals.

The ingenious Mr. Bewick, to whose skill and industry we are indebted at once for the recovery and improvement of an art which appeared to be almost lost, that of engraving on wood, has inserted in his concise and well-written History of Quadrupeds, an animal which appears to be of the bear species. This curious quadruped is said to have been brought from the interior part of Bengal, where it burrows in the ground. It is covered with black, shaggy hair, which on the back is 12 inches long, where it divides and forms a kind of bunch. The hair on its head is short, and the snout is of a yellowish-white. Its lips are thin and very long, and furnished with muscles, by which it can protrude them in a most singular manner. Its legs and feet resemble those of the common bear, and on each foot it has five long, crooked, white claws, which it uses either together or separately, like fingers, to break its food, and convey it to the mouth. It has no cutting teeth, but two very strong canine teeth, and six grinders in each jaw.

It is a gentle but sluggish animal, and feeds on bread, fruit, nuts, honey, or fat, but refuses roots, and the lean and muscular parts of flesh.

THE BEAVER.] In all countries, as man is civilized and improved, the lower ranks of animals are depressed and degraded. Either reduced to servitude, or treated as rebels, all their societies are dissolved, and all their united talents rendered ineffectual. Their feeble arts quickly disappear; and nothing remains but their solitary instincts, or those foreign habitudes which they receive from human education.

The beaver seems to be now the only remaining monument of that kind of intelligence in brutes, which, though infinitely inferior, as to its principle, to that of man, supposes, however, certain common projects, certain relative ends in view, projects which, having for their basis society, in like manner, suppose some particular method of understanding one another, and of acting in concert.

It is allowed, that the beaver, far from having an absolute superiority over the other animals, seems, on the contrary, to be inferior to some of them as to its qualities merely as an individual; and this fact is confirmed by observing a young beaver, which was sent to Paris from Canada in the beginning of the year 1758. It is an animal tolerably mild, tranquil and familiar, though rather, it would seem, gloomy and melancholy. If we consider this animal, therefore, in its dispersed and solitary state, we shall find, that as to internal qualities, it is not superior to other animals; that it has not more ingenuity than the dog, more sense than the elephant, or more cunning than the fox. It is rather remarkable for the singularities of its internal qualities. Of quadrupeds, the beaver alone has a flat oval tail, covered with scales, which serves as a rudder to direct its motions in the water. It is the only quadruped that has membranes between the toes on the hind feet, and at the same time none on the fore ones, which it uses as hands in carrying food to the mouth. It is the only one which, while it resembles a terrestrial animal in its fore parts, seems to approach the nature of an aquatic being in its hind ones.

The beavers begin to assemble in the month of June or July, in order to form a society, which is to continue for the greatest part of the year. They arrive in numbers from every side, and presently form a company of two or three hundred. The place of meeting is commonly the place where they fix their abode; and this is always by the side of some lake or river. If it be a lake in which the waters are always upon a level, they dispense with building a dam; but if it be a running stream, which is subject to floods and

falls, they then set about building a dam, or pier, that crosses the river, so as to form a dead water in that part which lies above and below. This dam, or pier, is often four score or an hundred feet long, and ten or twelve feet thick at the base. If we compare the greatness of the work with the power of the architect,* it will appear enormous; but the solidity with which it is built is still more astonishing than its size. The part of the river over which this dam is usually built, is where it is most shallow, and where some great tree is found growing by the side of the stream. This they pitch upon as proper for making the principal part in their building; and, though it is often thicker than a man's body, they yet instantly set about cutting it down. For this operation they have no other instrument but their four incisive teeth, which soon lay it level, and that also on the side they wish it to fall, which is always across the stream. They then set about cutting the top branches, to make it lie close and even, and serve as the principal beam of their fabric.

These operations are performed in common. At one time a number of beavers are employed together at the foot of the tree in gnawing it down; and, when this part of their labour is accomplished, it becomes the business of others to sever the branches, while a third party are engaged along the borders of the river, or lake, in cutting other trees, which, though smaller than the first tree, are yet as thick as the leg, if not the thigh of a common-sized man. These they carry with them by land to the brink of the river, and then by water to the place allotted for their building; where, sharpening them at one end and forming them into stakes, they fix them in the ground, at a small distance from each other, and fill up the vacant spaces with pliant branches. While some are thus employed in fixing the stakes, others go in search of clay, which they prepare for their purpose with their tails and their feet, and with which, brought home in large quantities, they render their structure still more compact.

This structure is so ingeniously contrived, that it has not only all the extent, and all the solidity, which are requisite, but also a form the most proper for confining the water, and, when it has passed its bounds, for maintaining its weight, or baffling its attacks. At the top of their dike or

* The largest beavers weigh from fifty to sixty pounds, and, in length, are little more than three feet from the tip of the snout to the insertion of the tail.

mole, that is, at the part where it is least thick, they form two or three openings. These they occasionally enlarge or contract, as the river occasionally rises or falls ; and when, from inundations either too powerful or too sudden, their works have been damaged, they are, with the utmost diligence and application, on the retreat of the waters, immediately repaired.

After this display of their labours to accomplish a public work, it would be superfluous to add to it a description of their private constructions, were it not that, in history, an account should be given of every fact, and that, in this first grand work of the beaver, the intention uniformly was, that the little habitation of each family should be rendered more commodious.

This habitation is always furnished with two passages ; one for the purpose of a land, and the other of a water excursion. In shape it is almost always either oval or round ; sometimes it is from four to five feet in diameter, and sometimes it consists of two, and even three stories, while the walls are always two feet thick. When it happens to consist of but one story, the walls are but a few feet high, over which there is a kind of vault that terminates the edifice, and serves as a covering for it. It is constructed with such solidity as to be impenetrable to the heaviest rains, to defy the most impetuous winds, and is plastered with such neatness, both outwardly and inwardly, that one might actually suppose it to be the work of man. These animals, nevertheless, use no instrument for the preparation of their mortar, but their feet, or for the application of it, but their tails. They chiefly use such materials as are not easily dissolved by water. Their wooden work consists of such trees as grow on the banks of rivers, as these are most easily cut down, stripped of their bark, and carried ; and all these operations they perform before they relinquish a tree which they have once attacked. They cut it at the distance of a foot or a foot and a half from the ground. They sit as they work ; and, besides the advantage of this convenient posture, they have the pleasure of continually gnawing fresh bark and soft wood, both which they prefer to most other kinds of aliment. Averse to dry wood, they always provide an ample store of these for their subsistence during the winter.* It is near their habitations that they establish their maga-

* The space allotted for the provision of eight or ten beavers occupies from twenty-five to thirty feet square, and from eight to ten feet long.

zines ; and to each hut or cabin there is one allotted, of a size proportioned to the number of its inhabitants, to which they have all a common right ; nor do they offer to plunder their neighbours.

Hamlets, so to express them, have been seen composed of twenty and even twenty-five dwellings. Such large settlements, however, are rare. In general they do not contain more than ten or a dozen families, each of which has its own separate district, magazine, and habitation ; nor will it allow any strangers to settle within its inclosure. The smallest dwellings contain two, four, and six ; the largest eighteen, twenty, and it is even said thirty beavers ; and it seldom or never happens, that the number of males and females is not upon a par. Moderately speaking, therefore, their society may be said to consist frequently of 150 or 200 workmen, who, having first exerted their united industry and diligence in rearing a grand public work, afterwards form themselves into different bodies, in order to construct private habitations.

However numerous the republic of beavers may be, peace and good order are uniformly maintained in it. A common series of toil has strengthened their union ; the conveniences which they have procured for each other, and the abundance of provision which, after having amassed, they continue to consume together, render them happy within themselves ; and, having moderate appetites, entertaining even an aversion to blood and carnage, they have not the smallest propensity to hostility or rapine, but actually enjoy all the blessings which man is only born to desire. Friends to each other, if threatened by any enemies from abroad, they know how to avoid them ; and for this purpose, on the first alarm, they give notice of their mutual danger by striking the water with their tails, which sends forth a sound that is heard in their most distant dwellings. On this occasion, each beaver, as he thinks most expedient, plunges into the water, or conceals himself within the walls of his own habitation, which is in no danger but from the fire of the angry heavens, or from the weapons of man, and which no animal dares attempt to open or to overturn.

These asylums are not only secure, but also very neat and commodious. The floor is covered with verdure, young and tender branches of trees serving them for a carpet, on which they never permit any of their excrements to be left. The window which fronts the water serves

them for a balcony, from which they enjoy the fresh air, and bathe themselves the greatest part of the day. In the water they remain in an upright posture, the head, and fore parts only being visible. This element is, indeed, so necessary to them, or rather gives them so much pleasure, that they seem unable, as it were, to live without frequent immersions in it. Sometimes they go to a considerable distance under the ice; and then they are easily taken, by attacking the dwelling on one hand, and lying in wait for them, at the same time, at a hole which is purposely formed a little way off in the ice, and to which they are obliged to come for breath.

The habit which this animal has of continually keeping the tail, and all the hind parts of the body in water, seems to have changed the nature of its flesh. That of the fore parts, till we come to the reins, is of the same quality, taste, and consistency, as the flesh of land-animals; that of the tail, and of the hind legs and thighs, has the smell, the savour, and all the qualities of fish. As for the tail, in particular, it is even an extremity, an actual portion, of a fish fixed to the body of a quadruped. In length it generally measures a foot, in thickness an inch, and in breadth five or six inches. It is entirely covered over with scales, and has a skin altogether the same as that of a large fish.

The females are said to go four months with young. They bring forth about the close of winter, and their number generally consists of two or three at a time. Nearly at this period the males leave them, and go forth into the fields, where they enjoy all the sweets of the spring. In this season they pay occasional visits to their habitation, but never reside in it. There, however, the females remain employed in suckling, tending, and rearing their little ones, who are in a condition to follow them at the expiration of a few weeks. They then, in their turn, go abroad, where they feed on fish, or on the bark of young trees, and pass the whole of their time upon the water, or among the woods.

Winter is the season which is principally allotted for hunting them, as it is then only that their fur is in perfection; and when, after their fabrics are demolished, a great number happen to be taken, their society is never restored; the few that have escaped captivity or death, disperse themselves, and become houseless wanderers; or concealed in some hole under ground, and reduced to the condition of other animals, they lead a timid life, no longer employ themselves but to satisfy their immediate,

and most urgent wants, no longer retain those faculties and qualities which they eminently possess in a state of society.

We meet with beavers in America from the thirtieth degree from north latitude to the sixtieth, and even beyond it. In the northern parts they are very common ; and the farther south we proceed, their number is still found to decrease. The same observation holds with respect to the Old Continent : we never find them numerous but in the more northern countries ; and in France, Spain, Italy, Greece, and Egypt, they are exceedingly rare. The ancients knew them ; and by the religion of the Magi it was forbidden to kill them.

Several authors have said, that the beaver, being an aquatic animal, could not live solely on land. This opinion, however, is erroneous ; for the beaver, which was mentioned in a preceding paragraph, having been taken, when quite young, in Canada, and always reared in the house, did not know the water when he was brought to it, was afraid of it, and refused to go into it. Even when first plunged into a basin there was a necessity for keeping him in it by force. A few minutes after, nevertheless, he became so well reconciled to it, that he no longer shewed an aversion to his new situation ; and, when afterwards left to his liberty, he frequently returned to it of himself, and would even roll about in the dirt, and upon the wet pavement. One day he made his escape, and descended by a cellar stair-case into the quarries under the Royal Garden. There he swam to a considerable distance on the stagnated waters which are at the bottom of those quarries ; yet no sooner did he see the light of the torches which were ordered down for the purpose of finding him, than he returned, and allowed himself to be taken without making the smallest resistance.

He is an animal familiar without being fawning ; and when he sees people at table, he is sure to ask for something to eat. This he does by a little plaintive cry, and by a few gestures of his fore paws. When he has obtained a morsel, he carries it away, and conceals himself, in order to eat it at his ease. When he sleeps, which he does very often, he lies upon his belly. No food comes amiss to him, meat excepted ; and this he constantly refuses either raw or boiled. He gnaws every thing he comes near ; and it was found necessary to line with tin the tun in which he was brought over.

Independently of the fur, which is indeed the most valuable article furnished by the beaver, this animal furnishes a substance that has been considerably used in medicine. This substance, which is known by the name of *castor*, is contained in two bladders.* The savages, it is said, obtain an oil from the tail of the beaver, which they employ as a topical remedy for different complaints. The flesh of this animal, though fat and delicate, is yet bitter, and disagreeable to the palate.

The senses of the beaver are very acute ; and so delicate is its smell, that it will suffer no filth, no bad stench, to remain near it. When kept too long in confinement, and under a necessity of voiding its excrement, it drops them near the threshold of its prison, and when the door is opened, is sure to push them out.

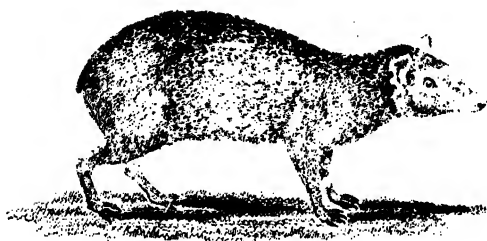
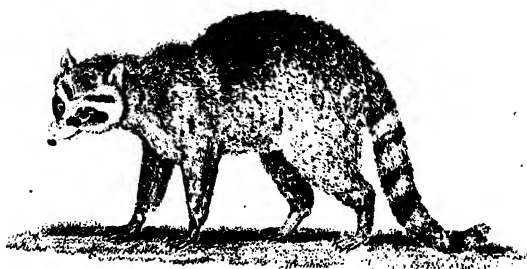
THE RACCOON is an animal of about the same size as a small badger ; its body is short and bulky ; its fur is fine, long, thick, blackish at the surface, and grey towards the bottom ; its head like that of a fox, but its ears are round and shorter ; its eyes are large, of a yellowish green, and over them there is a black and transverse stripe ; its snout is sharp, its tail is thick, but tapering towards a point, and marked alternately from one end to the other with black and white rings, and is at least as long as the body ; its fore legs are much shorter than the hind ones, and both are armed with five strong sharp claws.

This animal uses its paws to hold its food while eating ; and its pointed claws enable it to climb trees with great facility. It turns up the trunk with the same swiftness that it moves over the plain, and frolics about to the extremity of the branches with great security and ease : on the ground, indeed, it rather bounds than runs, and its motions, though oblique, are yet always quick and expeditious.

The racoon is a native of the southern countries of America and the West-Indies, nor has it ever yet been found in any part of the Old Continent.

THE COATI. This animal, of which we are now about to treat, many authors have called *coati-mondi*. It is very

* It is pretended, that the beavers extract the liquid which is contained in these bladders by pressing them with the foot ; and that it gives them an appetite when they are averse to food. The truth, however, seems to be, that the animal uses this liquid in order to grease its tail.



different from the animal described in the preceding article. It is of a smaller size than the racoon ; its body and neck, its head and nose are of a more lengthened form ; its upper jaw is an inch, or an inch and a half, longer than the lower one ; and its snout, which is moveable in every direction, turns up at the point. The eyes of the coati are also smaller than the eyes of the racoon ; its hair is longer and coarser, its legs are shorter, and its feet longer ; but, like the racoon, its tail is diversified with rings ; and to all its feet there are five claws.

This animal has a practice of eating its own tail, which, when not mutilated, is longer than its body, and which it generally rears aloft, and can move with ease in any direction.

From this circumstance one general inference may be drawn ; namely, that those parts which are elongated to a great degree, and of which the extremities are consequently very remote from the seat of the senses, from the centre of feeling, that feeling must be weak, and the more so the greater the distance and the smaller the part.

As for the coati in other respects, it is an animal of prey, which subsists on flesh and blood, which, like the fox, destroys small animals and poultry, hunts for the nests of little birds, and devours their eggs ; and it is, probably, from this conformity of disposition that some authors have considered the coati as a species of small fox. It inhabits Brazil and Guinea.

THE AGOUTI. This animal is about the size of a hare, and has been considered, erroneously, as a kind of rabbit, or large rat, by the generality of nomenclators. As it has the hair of a hog, so also it has the voracious appetite of that animal. It eats indiscriminately of all things ; and when satiated, it hides the remainder, like the dog or the fox, for a future occasion.

It does not, like the rabbit, dig a hole in the ground, but burrows in the holes of trees. Its ordinary food consists of the roots of the country, potatoes, yams, and such fruits as fall from the trees in autumn. It uses its forepaws like the squirrel, to carry its food to its mouth ; and as its hind feet are longer than the fore ones, it runs very swiftly upon plain ground, or up a hill, but upon a descent it is in danger of falling. Its sight is excellent ; its hearing equals that of any other animal ; and whenever it is whistled to, it stops to hearken. The flesh is dressed like

that of a sucking pig, and of such as are well fed, is tolerable food, though it has always a peculiar taste, and is rather rough.

It is hunted by dogs; and whenever it goes into a sugar-ground, where the canes cover the place, it is easily overtaken; for it is embarrassed every step it takes, so that a man may easily come up with it, and kill it without any other assistance than a stick. When in the open country, it usually runs with great swiftness before the dogs until it gains its retreat, within which it continues to hide, and nothing but filling the hole with smoke can force it out. For this purpose the hunter burns faggots or straw at the entrance, and conducts the smoke in such a manner that it fills the whole cavity. While this is doing, the poor little animal seems sensible of its danger, begs for quarter with a most plaintive cry, but seldom quits its hole till the utmost extremity.

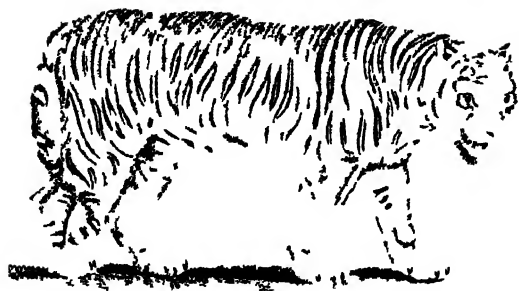
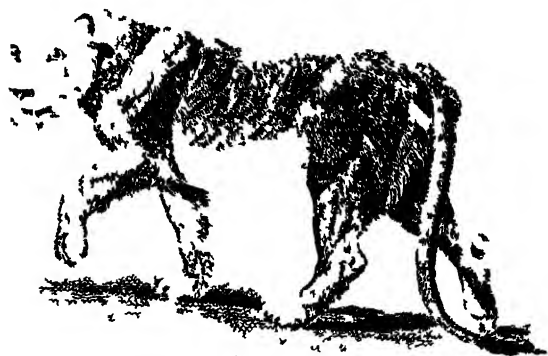
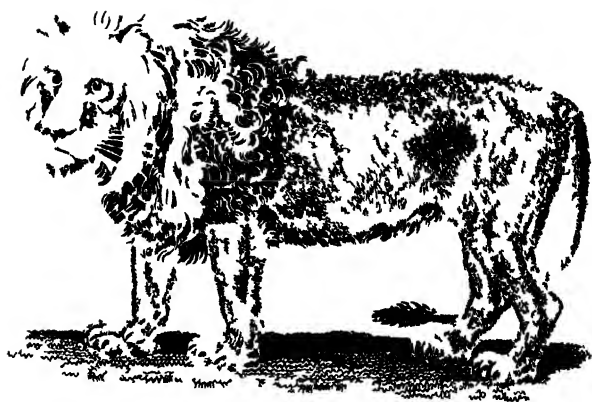
The agouti seems to be a native of the south parts of America; nor is it at all known in the Old Continent. It is, however, very common in Brazil, Guiana, St. Domingo, and all the islands around. To the cold and temperate climate of America this animal is an utter stranger.

CHAP. XIV.

Of carnivorous Animals continued—The Lion—the Puma, or American Lion—The Tiger—The Panther, Ounce, and Leopard—The Jaguar—The Conguar—The Lynx—The Caracal—The Hyena—The Civet and Zibet—The Genett—The Ondatra, and Desman.

THE LION.

It has been remarked, that in all hot climates the terrestrial animals are larger and stronger than in cold or temperate ones. They are also bolder and more ferocious, all their natural qualities seeming to partake of the ardour of the climates in which they live. The lion, born beneath the burning sun of Africa or of India, is above all others the fiercest and most terrible. Our wolves, our other carnivorous animals, far from being his rivals, are hardly worthy to be his providers. The lions of America (if, indeed, they deserve to be called lions) are, like the climate in which they are produced, infinitely milder than those of



Africa; and, what plainly proves that the degree of fierceness in this animal depends on the degree of heat, is, that, even in the same country, those which inhabit the high mountains, where the air is more temperate, are different in disposition from those that dwell in the plains, where the heat is excessive.

As the lion has no enemy but man, and his species is now probably reduced to the fiftieth part of what it formerly was, it follows, that the human race, instead of having suffered a considerable diminution since the time of the Romans, is, on the contrary, more numerous, and more generally diffused. This superiority in the numbers, and the arts of the human species, while it suffices to conquer the lion, serves also to enervate and to discourage him; for he is brave only in proportion to the success of his former encounters. Accustomed to measure his strength with every animal he meets, the habit of conquering renders him intrepid and terrible. Having never experienced the dangerous arts and combinations of man, these animals have no apprehensions from his power. They boldly face him, and seem to brave the force of his arms. They are not daunted even with the opposition of numbers: a single lion of the desert often attacks an entire caravan; and, after an obstinate combat, when he finds himself overpowered, instead of flying, he continues to combat, retreating, and still facing the enemy till he dies. On the contrary, the lions which inhabit the peopled countries of Morocco, or India, having become acquainted with man, and experienced the superiority of his arms, have lost all their courage, so as to be scared away with a shout; and seldom attack any but the unresisting flocks or herds, which even women and children are sufficient to protect.

The outward form of the lion seems to speak the superiority of his internal qualities. His figure is striking, his look confident and bold; his gait proud, and his voice terrible. His stature is not over-grown, like that of the elephant, or the rhinoceros; nor is the shape clumsy, like that of the hippopotamos, or the ox. He is in every respect compact and well-proportioned, a perfect model of strength joined with agility.

His force and muscular power he manifests outwardly by his prodigious leaps and bounds; by the strong and quick agitation of his tail, which alone is sufficient to

throw a man on the ground; by the facility with which he moves the skin of his face, and particularly that of his forehead, which adds greatly to his physiognomy, or rather to the expression of fury in his countenance; and lastly, by the facility he has of shaking his mane, which is not only bristled up, but moved and agitated on all sides when he is enraged.

The largest lions are about eight or nine feet in length from the snout to the insertion of the tail, which is of itself four feet long; and these large lions are about four or five feet in height. Those of the small size are about five feet and a half in length, and three and a half in height. In all her dimensions, the lioness is about one fourth less than the lion.

The lion is furnished with a mane, which becomes longer in proportion as he advances in age. The lioness, however, is without this appendage at every age. The American animal, which the natives of Peru call *PUMA*, and to which the Europeans have given the denomination of *lion*, has no mane; it is also much smaller, weaker, and more cowardly, than the real lion. In truth, it is very doubtful whether these animals are at all of the same species.

Both the ancients and the moderns allow that the lion, when newly born, is in size hardly superior to a weasel; in other words, that he is not more than six or seven inches long; and if so, some years at least must necessarily elapse before he can encrease to eight or nine feet. They likewise mention, that he is not in a condition to walk till two months after he is brought forth; but, without giving entire credit to these assertions, we may, with great appearance of truth, conclude, that the lion, from the largeness of his size, is at least three or four years in growing, and that, consequently, he must live seven times three or four years, that is, about twenty-five years.

It is usually supposed that the lion is not possessed of the sense of smelling in such perfection as most other animals of prey. It is also remarked, that too strong a light incommodes him; that he seldom goes abroad in the middle of the day; that he commits all his ravages in the night; and that, when he sees a fire kindled near a herd or flock, he will not venture near it; that though his sight is bad, it is not, however, so faulty as his smell; and that, unlike the dog or the wolf, he rather hunts by the former than by the latter.

The lion, when hungry, boldly attacks all animals that come in his way ; but, as he is very formidable, and as they all seek to avoid him, he is often obliged to hide, in order to take them by surprise. For this purpose he crouches upon his belly, in some thicket, or among the long grass, which is found in many parts of the forest. In this retreat he continues, with patient expectation, until his prey comes within a proper distance ; and he then springs after it with such force, that he often seizes it at the first bound. If he misses the effort, and in two or three reiterated springs cannot seize his prey, he continues motionless for a time, seems to be very sensible of his disappointment, and waits for a more favourable opportunity. He devours a great deal at a time, and generally fills himself for two or three days to come. His teeth are so strong that he very easily breaks the bones, and swallows them with the rest of the body. It is reported that he sustains hunger a very long time ; but thirst he cannot support in an equal degree, his temperament being extremely hot. He drinks as often as he meets with water, lapping like a dog. He generally requires about fifteen pounds of raw flesh in a day, and seldom devours the bodies of animals when they begin to putrefy ; but he chooses rather to hunt for fresh spoil than return to that which he had left half devoured before. While young and active, the lion subsists on what he can obtain by the chace, and seldom quits his native deserts and forests ; but when he becomes old, heavy, and less qualified for exercise, he approaches the habitations of man, to whom, and to domestic animals, he then becomes a more dangerous enemy. It is observed, however, that when he sees men and animals together, it is always on the latter, never on the former, that he vents his fury ; unless indeed he should be struck, and then, at no loss to know whence the blow came, he instantly deserts his prey, in order to obtain revenge for the injury. The flesh of the camel he is said to prefer to that of any other animal. He is likewise exceedingly fond of that of young elephants, which, from their inability to resist him till they have received the assistance of their tusks, he easily dispatches, when unprotected by the dam ; nor are there any animals able to oppose the lion but the elephant, the rhinoceros, the tiger, and the hippopotamus.

However terrible this animal may be, it is not uncommon, with dogs of a large size, and well supported with

a proper number of men on horseback, to chase him, dislodge him, and force him to retire. But for this enterprize it is necessary that the dogs, and even the horses, should be previously disciplined; since almost all animals tremble and fly at the very smell of the lion. Though his skin is firm and compact, it is not, however, proof against a musket-ball, nor even a javelin; but he is seldom known to be dispatched with one blow. Like the wolf, he is frequently taken by stratagem; and for this purpose a deep hole is dug in the earth, over which, when slightly covered with earth and sticks, some living animal is fastened as a bait. When thus entrapped all his fury subsides; and if advantage is taken of the first moments of his surprise, or his disgrace, he may easily be chained, muzzled, and conducted to a place of security.

The flesh of the lion is of a strong and disagreeable flavour; yet the Negroes and the Indians do not dislike it, and it frequently forms a part of their food.

THE TIGER. In the class of carnivorous animals the lion is the foremost. Immediately after him follows the tiger; which, while he possesses all the bad qualities of the former, seems to be a stranger to his good ones. To pride, to courage, to strength, the lion adds greatness, and sometimes, perhaps, clemency; while the tiger, without provocation is fierce, without necessity is cruel. Thus it is throughout all the classes of Nature, in which the superiority of rank proceeds from the superiority of strength. The first class, sole masters of all, are less tyrannical than the inferior classes, which, denied so full an exertion of authority, abuse the powers entrusted to them.

More, therefore, than even the lion, the tiger is an object of terror. He is the scourge of every country which he inhabits. Of the appearance of man, and of all his hospitable weapons, he is fearless; wild animals as well as tame ones fall sacrifices before him; the young elephant and rhinoceros he sometimes attacks; and sometimes, with an increased audacity, he braves the lion himself.

The form of the body usually corresponds with the nature, the disposition of the animal. The tiger, with a body too long, with limbs too short, with a head uncovered, and with eyes ghastly and haggard, has no characteristics but those of the basest and most insatiable cruelty. For instinct he has nothing but an uniform rage, a blind fury; so blind indeed, so undistinguished, that he frequently devours his

own progeny, and, if she offers to defend them, tears in pieces the dam herself.

Happy is it for the rest of nature that this animal is not common, and that the species is chiefly confined to the warmest provinces of the East. The tiger is found in Malabar, in Siam, in Bengal, and in all the countries which are inhabited by the elephant and the rhinoceros.

When he has killed a large animal, such as a horse, or a buffalo, he does not choose to devour it on the spot, fearing to be disturbed; and in order to feast at his ease, he carries off his prey to the forest, dragging it along with such ease, that the swiftness of his motion seems scarcely retarded by the enormous load he sustains.

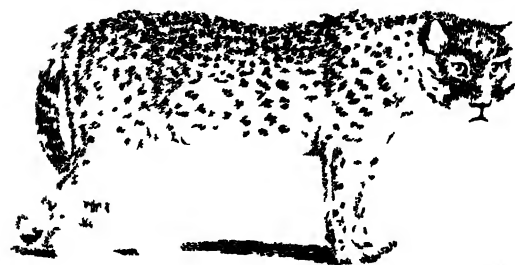
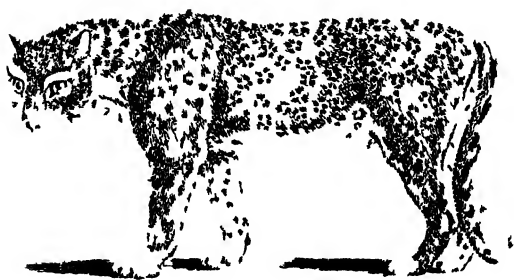
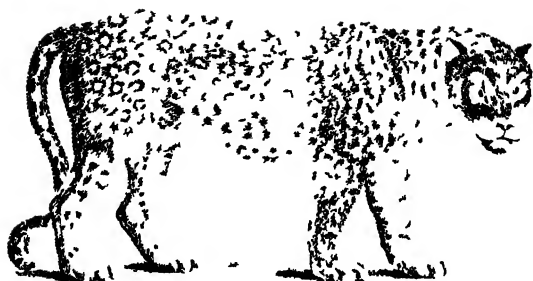
To give a still more complete idea of the strength of this terrible creature, we shall quote a passage from Father Tachard, who was an eye-witness of a combat of one tiger against two, and even three, elephants at Siam. For this purpose, the king ordered a lofty pallisade to be built of bamboo cane, about an hundred feet square; and in the midst of this were three elephants appointed for combating the tiger. Their heads and part of their trunks were covered with a kind of armour, like a mask, which defended that part from the assaults of the fierce animal with which they were to engage. As soon, says this author, as we were arrived at the place, a tiger was brought forth from his den, of a size much larger than we had ever seen before. He was not at first let loose, but held with cords, so that one of the elephants approaching, gave him three or four blows, with his trunk, on the back, with such force, that the tiger was for some time stunned, and lay without motion, as if he had been dead. As soon, however, as he was let loose, and at full liberty, although the first blows had greatly abated his fury, he made at the elephant with a loud shriek, and aimed at seizing his trunk. But the elephant, wrinking it up with great dexterity, received the tiger on his great teeth, and tossed him up into the air. This so discouraged the furious animal, that he no more ventured to approach the elephant, but made several circuits round the pallisade, often attempting to fly at the spectators. Shortly after, a second, and then a third elephant were sent against him, and they continued to strike him so terribly with their trunks, that he once more lay for dead; and they would certainly have killed him, had not a stop been put to the combat.

The tiger, of which Father Gouie has communicated to the Academy of Sciences an anatomical description, composed by the Jesuit Fathers at China, seems to belong to the true species, as does also that which the Portuguese have distinguished by the name of *Royal Tiger*. Dellon expressly says in his travels, that there is no country of India in which tigers so much abound as Malabar, that there the species are numerous, but that the largest of all is that which the Portuguese call the *Royal Tiger*, which is very rare, and is as large as a horse.

The species of the tiger has always been much rarer, and much less generally diffused, than that of the lion. Like the lioness, nevertheless, the tigress produces four or five young ones at a birth. From her nature she is fierce at all times; but when surrounded with her infant progeny, and in the smallest danger of losing them, her rage, her fury, becomes extravagant. To oppose the daring invaders of her den, she braves every danger. On such occasions, she pursues the spoiler with an enmity the most inveterate; and he, contented to lose a part, in order to save a part, is frequently obliged to drop one of her cubs. With this she immediately returns to her den, and again pursues him: he then drops another; and, by the time she has returned with that, he generally escapes with the remainder. Should her young be torn from her entirely, with hideous cries she expresses her agony, her despair, and follows the captor to the very town, or ship, in which he may have taken refuge, and dares him, as it were, to come forth.

The skins of these animals are much esteemed all over the East, particularly in China; the Mandarines cover their seats of justice in the public places with them, and convert them into coverings for cushions in winter. The Indians eat the flesh of the tiger, and find it neither disagreeable nor unwholesome.

THE PANTHER, THE OUNCE, AND THE LEOPARD.
The first of these species which exist in the Old Continent is the *large panther*, which we shall simply call *panther*, and which the Greeks distinguish by the name of *pardalis*, the ancient Latins, first by the name of *panthera*, afterwards by that of *pardus*, and the modern Latins by the name of *leopardus*. The body of this animal, when it has attained its full growth, is five or six feet in length from the tip of the nose to the insertion of the tail, which is



1. Panther 2. Leopard 3. Cheetah

above two feet long. Its skin is of a yellow hue, more or less dark on the back and sides, and whitish under the belly; it is marked with black spots annular, or in the form of beads; of these rings the generality have one or more spots in the centre, of the same colour as the outward edge of the ring; some of them are oval, and others circular; and they are frequently above three inches in diameter.

The second species is the *small panther* of Oppian, which our modern travellers have called *ounce*, or *onza*, corruptly from the name *lynx*, or *lunx*. To this animal we shall preserve the name of *ounce*, which, as it has in fact some affinity to the *lynx*, seems to be properly applied. It is much smaller than the panther; its body, which is nearly of the size of the *lynx*, being about three feet and a half in length. Its hair, as also its tail, are longer than those of the panther. The latter frequently measures above three feet; though the body of this animal is in all at least a third less than that of the panther, whose tail does not measure more than two feet, or two and a half at most. The hair of the ounce is of a whitish grey upon the back and sides, and of a grey still whiter under the belly; whereas the back and sides of the panther are always of a yellow more or less deep. In both, however, the spots are nearly of the same form, and of the same size.

The third species is unnoticed by the ancients, as it belongs to Senegal, to Guinea, and to other southern countries which they had discovered. This animal we shall call *leopard*; a name which has been improperly applied to the large panther, but which, following the example of the generality of travellers, we shall never use unless to denote the above-mentioned animal of Senegal. It is somewhat larger than the ounce, but considerably smaller than the panther, being only four feet in length. The tail measures two feet, or two feet and a half. On the back and sides the hair is of a yellow colour more or less deep; under the belly it is whitish; the spots are annular, but smaller, and less regularly disposed.

As each of these animals is different from the other, so each forms a separate species. Our furriers call the skins of the first species *panther-skins*; a name which, as it is established by use, we shall not change; those of the second species they call *African tiger-skins*; which, being an equivocal name, we have set aside, and adopted that of *ounce*; lastly, they improperly call *tiger-skins*, the skins of the

animal to which we have here given the denomination of leopard.

The species of the ounce seems to be more numerous ; as well as more generally diffused, than that of the panther. In Barbary, in Arabia, and in all the southern parts of Asia, Egypt perhaps excepted, it is very common. Even in China, it is not unknown ; and there it is distinguished by the name of *hinen-pao*.

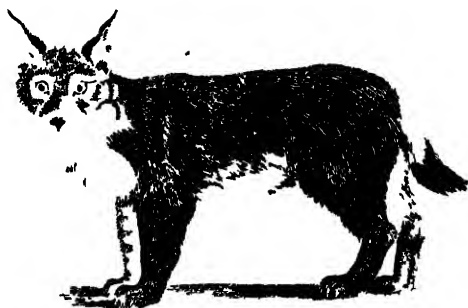
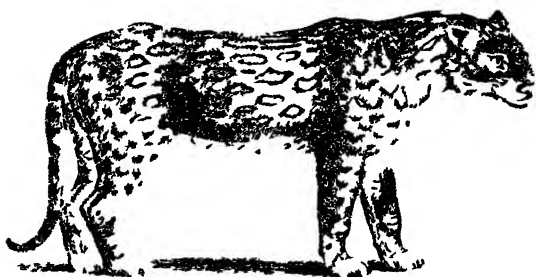
The ounce is easily tamed, and is employed for the chase in the hot climates of Asia, where the dog is an animal rarely to be found, not to be found at all indeed, unless introduced from other parts ; and then it not only loses its voice, but its instinct. Besides, the panther, the ounce, and the leopard, are alike remarkable for bearing an insuperable antipathy to dogs ; them, indeed, they seem to hunt for, and to attack, in preference to all other animals.

THE JAGUAR resembles the ounce in size, and for the most part in the form of the spots with which his skin is diversified. In disposition he also resembles him. He is less terrible, less ferocious, than the panther and the leopard. The ground of his colour, like that of the latter, is a bright yellow, and not grey, like that of the ounce. His tail is shorter than that of either of those animals ; his hair is longer than the panther's, but shorter than that of the ounce ; it is frizzled while he is young, but smooth and straight when he attains his full growth.

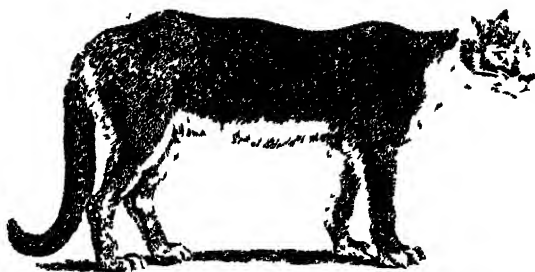
The jaguar lives by prey like the tiger ; but a lighted torch will put him to flight, will deprive him of all courage, all vivacity ; and on such occasions, especially if already satiated, one dog alone is sufficient to give him chase. He seems in all respects to partake of the indolence arising from the nature of the climate ; nor does he discover any activity or alertness, unless when pressed by hunger.

Almost all the authors who have written the History of the New World, have made mention of this animal ; some under the name of *tiger*, or *leopard*, others under the names which it bears in Brazil, Mexico, &c. They also speak of another animal of the same genus, and perhaps indeed of the same species, under the name of *jaguet*.

The jaguar is found in Brazil, in Paraguay, in Tucuman, in Guiana, in the country of the Amazons, in Mexico, and in all parts of South America. The jaguet appears to have been always more rare, or at least this



2



3

1. Jaguar - 2. Lynx - 3. Cougar

creature has always inhabited such places as are more distant from the haunts of men.

THE COUGUAR is equal in length, but inferior in thickness to the jaguar. He has a small head, a long tail, short hair, which is nearly of one entire colour, a lively red, intermixed with a few blackish tints, particularly on the upper part of the back. His chin is whitish, as are also his neck, and all the inferior parts of his body. Though less strong than the jaguar, he is yet to the full as fierce, and perhaps more cruel. He appears to be yet more greedy of prey; nor, when once seized, does he ever offer to relinquish it till he has fully glutted his appetite, and his blood-thirsty fury.

This animal is not uncommon in Guiana. Formerly couguars were known to swim over in numbers to the island of Cayenne, in order to attack and devour the flocks; insomuch, that they were considered at first as a scourge to the colony. By degrees, however, the settlers lessened their number, and at length they completely drove those that remained far from their habitations.

The couguar, by the agility of his body and the length of his legs, seems calculated to run, and to climb trees better than the jaguar. They are both equally remarkable for sloth and cowardice when once glutted with prey; and seldom are they known to attack men, unless when they find them asleep. They delight in the lofty shades of forests, where they hide themselves in the covert of some thick tree, in order to dart forth on such animals as pass by. Though they live only upon prey, and quench their thirst more frequently with blood than with water, yet it has been said by some, that their flesh is exceedingly palatable. Piso says expressly, that it is as good as veal; and Charlevoix and others have compared it to mutton. It is hardly credible, however, from the above circumstances, that it can be well tasted; and therefore I prefer the testimony of Desmarchais, who intimates, that the best thing about this animal is his skin, with which they make housings for horses, and that its flesh is of no value, being generally lean, and of a disagreeable flavour.

THE LYNX is an animal more commonly found in cold than in temperate climates; and is at least very rare in hot ones. It was known to the Greeks and the Latins. Pliny says, that the first which were seen in Rome were brought

in the time of Pompey, from Gaul. At present they are not seen in France, a few perhaps excepted, belonging to the Alpine and Pyrenean Mountains. But the Romans, under the name of Gaul, comprehended several northern countries; and, besides, it is an acknowledged truth, that modern France is by no means so cold as was ancient Gaul.

The most beautiful skins of the lynx are brought from Siberia, as belonging to the *lupus-cervarius*; and from Canada, as belonging to the *felis-cervarius*; because being, like all other animals of the New Continent, smaller than those of the Old World; in Europe they are compared to a wolf in size, and in Canada to a wild cat.

The lynx, of which the ancients have said, that the sight was so sharp as to penetrate opaque bodies, and of which the urine was made to possess the marvellous property of hardening into a solid substance a precious stone, called *lapis lynceus*, is an animal which never existed, any more than all the properties attributed to it, but in fable. To the true lynx this imaginary one has no affinity, but in name. We must not, therefore, as the generality of naturalists have hitherto done, attribute to the former, which is a real being, the properties of this imaginary one, the existence of which Pliny himself does not seem disposed to believe, since he speaks of it only as an extraordinary beast, and classes it with the sphynx, the pegasus, and other prodigies, or monsters, the produce of Æthiopia.

Our lynx possesses not the wonderful quality of seeing through walls; but it has bright eyes, a mild aspect, and, upon the whole, an agreeable and lively appearance. Its urine produces not precious stones, but like the cat, an animal which it nearly resembles, and of which it retains the manners, and even the cleanliness, it covers it over with the earth.

The lynx has short legs, and is generally about the size of the fox. It differs from the panther and the ounce in the following particulars: it has long hair, its marks or spots are of a colour less lively, and are badly disposed: its ears are surrounded at the extremity by a stripe, or rather tuft, of black hair; its tail, which is much shorter, is black at the tip; its eyes have a whitish cast; and its countenance has something in it more agreeable, and less ferocious. The skin of the male is more beautifully marked than that of the female. It does not walk or run like the wolf in a progressive motion, but leaps and bounds like the cat. It gains



its sole subsistence by devouring other animals; and these it will follow to the very tops of trees. Neither can the wild cat, the martin, the ermine, nor the squirrel, escape its pursuit. It also seizes birds, lies in wait for the stag, the roebuck, and the hare, and with one bound often seizes them by the throat. When in possession of its prey, it first sucks the blood of the animal, and then lays open his head, in order to devour the brains. This done, it generally abandons the victim of its fury, goes in search of fresh prey, and is seldom known to return to the former; a circumstance which has given rise to the vulgar remark, that of all animals the lynx has the shortest memory. The skin of this animal changes its colour according to the season and the climate. In winter it is in every respect better than it is in summer; and its flesh, like the flesh of all beasts of prey, is not proper to eat.

THE CARACAL, OR SYAGUSH. Though the caracal resembles the lynx in size, in the formation of the body, the aspect of the head; and, though like that animal, it seems to have the peculiar, and almost singular characteristic of a stripe of black hair at the extremity of the ears, I do not scruple, nevertheless, from their disagreement in other respects, to treat of them as animals of different species.

The caracal is not spotted like the lynx; it has hair rougher and shorter, its tail is larger, and of an uniform colour; its snout is more elongated; in appearance it is less mild, and in disposition it is fiercer. The lynx is an inhabitant of the cold, or at most of the temperate regions; the caracal is only found in the hot countries; and it is as much from their difference in disposition and climate that I have judged them to be of two different species, as from the inspection and comparison of the animals themselves.

The caracal is common in Barbary, in Arabia, and in all those countries which are inhabited by the lion, the panther, and the ounce; like them it depends on prey for its subsistence; but, unlike them, from its inferior size, its inferior strength, to procure that prey it has much difficulty. Hardly, indeed, has it aught to subsist on but what the more potent carnivorous animals are disposed to leave for it. It keeps at a distance from the panther, because that animal exercises its cruelty even after he is satisfied with food; but it follows the lion, who, when the immediate cravings of his appetite are gratified, is of a disposition altogether unhostile. From the refuse of what this noble animal has devoured, the caracal frequently enjoys a comfortable meal.

Sometimes, even while the other is in search of prey, depending on its agility in climbing the trees, it accompanies him at a certain distance, and when self-preservation seems to render it necessary, perching itself aloft, it braves the fury of the lion, who cannot ascend after it like the panther. For all these reasons it is, that the caracal has been called "the lion's guide," "the lion's provider;" and that the lion, whose smell is far from being acute, is said to employ this animal to find out prey for him by its scent, of which, for its trouble, it enjoys the remains when its master is satisfied.

The caracal is about the size of a fox, but much fiercer, and stronger. It has been known to attack, tear in pieces, and destroy in a few minutes, a large dog, who, fighting for his life, defended himself with all his strength. It is very difficult to tame this animal; yet if taken when very young, and afterwards reared with care, it may be trained to the chase, to which it is by nature inclined, and in which it is sure to succeed, provided it is not let loose but against such animals as are its inferiors, and unable to resist it. Should it be a service of danger, with every expression of reluctance it declines it. In India they make use of this animal to take hares, rabbits, and even large birds, all of which it surprises, and seizes with singular address and facility.

THE HYÆNA.] So striking, and even so singular are the characteristics of the hyæna, that it is hardly possible to be deceived by them. It is perhaps, the only quadruped which has but four toes to either the fore or hind feet; like the badger it has an aperture under the tail, which does not penetrate into the interior parts of the body; its ears are long, strait, and bare; its head is more square and shorter than that of the wolf; its legs, the hind ones especially, are longer; its eyes are placed like those of the dog; the hair of its body, and its mane, are of a dark grey, with a small intermixture of yellow and black disposed all along in waves; and though in size it equals the wolf, yet it has a contracted appearance, on which account alone it could ever have been considered as smaller than that animal.

This solitary creature resides in the caverns of mountains, in the clefts of rocks, or in dens, which it has formed for itself under the earth. Though taken ever so young, it is yet incapable of being tamed. It lives by depredation, like the wolf; but it is a stronger animal, and seemingly



more daring. It sometimes attacks man, carries off cattle, follows the flocks, breaks open the sheep-cotes by night, and ravages with a voracity insatiable. By night also its eyes shine; and it is maintained that he sees better than in the day. If we may credit all the naturalists who have treated of this animal, its cry resembles the sobs or reachings of a man in a violent fit of vomiting; but, according to Kæmpfer, who was an ear-witness of the fact, it sounds like the lowing of a calf.

The hyæna defends itself against the lion, stands in no awe of the panther, and attacks the ounce, which is incapable of resisting it. When at a loss for other prey, it scrapes up the earth with its feet, and devours the carcasses both of animals and men, which, in the countries that it inhabits, are interred promiscuously in the fields. We find this creature in almost all the hot climates of Africa, and of Asia; and it seems probable that the animal called *farasse*, at Madagascar, which resembles the wolf in figure, but which is larger, stronger, and more cruel, may, in fact, be the *hyæna*. A species is found at the Cape of Good Hope, which is of a reddish brown, with round black spots, and is, on that account, called the *Tiger Wolf*. It differs neither in its manners nor its appetites from the common hyæna.

Of few animals have so many absurd stories been told as of that we are now treating of. The ancients have gravely written, that the hyæna is male and female alternately. It plainly appears, however, that the circumstance which gave rise to this fable, is, the opening in the form of a cleft, which both the male and the female have independently of the parts destined for the purposes of generation. It has, moreover, been affirmed, that this creature could imitate the human voice, that it remembered the names of the shepherds, called to them, charmed them, rendered them motionless; that, at the same time, it gave chase to the shepherdesses; caused them to forget their flocks, to be distracted with love, &c. All these things might surely happen without the intervention of an hyæna; and I conclude this article, in order to avoid the reproach which is due to Pliny, of seeming to take pleasure in compiling and publishing fables.

THE CIVET AND THE ZIBET. The generality of naturalists have been of opinion, that there is only one species of animals that furnish the perfume known by the name of *civet*. Two animals that furnish it, however, are easily distinguishable.

To the first of these animals I have appropriated its original name of *civet*; and to the second, for the sake of distinction, I have given that of *zibet*.

The latter animal differs from the civet, in having a body longer and less thick, a snout flatter, more slender, and somewhat concave at the upper part; its hair is much shorter and softer; it has no mane, no black under the eyes, or upon the cheeks. All these characteristics are peculiar to, and very remarkable in, the civet. Some travellers had already suspected that there were two species of civets; but no person had distinguished them with sufficient accuracy to describe them.

These animals have been called *musk-cats*, or *civet-cats*; yet they have nothing in common with the cat. They rather resemble the fox, especially in the head. Their coat is diversified with stripes and spots; a circumstance which has occasioned them to be mistaken for small panthers by persons who had only seen them at a distance. In every other respect, however, they differ from the panther. The perfume of the civet is very strong, and that of the zibet is so to an excess.

This humour is found in the opening which each of these animals has in the neighbourhood of the parts of generation; and though the odour is so strong, it is yet agreeable, even when it issues from the body of the animal. The perfume of the civet we must not confound with musk, which is a sanguineous humour obtained from an animal altogether different from either the civet or the zibet.

The civets, though natives of the hottest climates of Africa, and of Asia, are yet capable of living in temperate, and even in cold countries, provided they are carefully defended from the injuries of the air, and provided with delicate and succulent food. In Holland, where no small emolument is derived from their perfume, they are frequently reared. The perfume of Amsterdam is esteemed preferable to that which is brought from the Levant, or the Indies, which is generally less genuine. That which is imported from Guinea would be the best of any, were it not that the Negroes, as well as the Indians and the people of the Levant, adulterate it with mixtures of laudanum, storax, and other balsamic and odorous drugs.

Those who breed these animals for the sake of their perfume, put them in a long and narrow sort of box, in which they cannot turn. This box the person who is employed to collect the perfume opens behind, for this purpose, twice

or thrice a week ; and, dragging the animal which is confined in it backward by the tail, he keeps it in this position by a bar before. This done, he takes out the civet with a small spoon, carefully scraping with it, all the while, the interior coats of the pouch. The perfume thus obtained, is put into a vessel ; and every care is taken to keep it closely shut.

The quantity which a single animal will afford, depends greatly upon its appetite, and the quality of its nourishment. It yields more, in proportion as it is more delicately and abundantly fed. Raw flesh hashed small, eggs, rice, small animals, birds, young fowls, and particularly fish, are the food in which the civet most delights.

As to the rest, the civet is a wild, fierce animal, and, though sometimes tamed, is yet never thoroughly familiar. Its teeth are strong and sharp ; but its claws are feeble and blunt. It is light and active, and lives by prey, pursuing birds and other small animals, which it is able to overcome. They are sometimes seen stealing into yards and outhouses, like the fox, in order to carry off poultry. Their eyes shine in the night ; and it is very probable that they see better by night than by day. When they fail of animal food, they are found to subsist upon roots and fruits. They very seldom drink ; nor do they ever inhabit humid ground ; but in burning sands, and in arid mountains, they cheerfully remain.

THE GENETT is an animal smaller than the civets. It has a long body, short legs, a sharp snout, and a slender head. Its fur, which is exceedingly smooth and soft, is of an ash-colour, glossy, and marked with black stripes, which are separate upon the sides, but which unite upon the back. It has also upon the neck a kind of mane, or longish hair, which forms a black streak from the head to the tail, which last is as long as the body, and is marked with seven or eight rings, from the insertion to the tip, which are alternately black and white.

The genett has under the tail, and in the very same place with the civets, an opening, or pouch, in which is separated a kind of perfume resembling civet, but less strong, and apt sooner to evaporate. It is an animal somewhat larger than the martin, which it strongly resembles, not only in the form of the body, but also in disposition and habit, and from which it seems chiefly to differ in being more easily tamed.

THE ONDATRA, and the DESMAN, are two animals which must not be confounded, though they have both been denominated *musk rats*, and though they have a few common characteristics.

The ondatra, or musk-rat of Canada, differs from the desman, in having its toes all separated from each other, in having eyes very conspicuous, and a snout very short ; whereas of the desman, or musk-rat of Muscovy, the toes of the hind feet are united by a membrane. The tail of both is flat ; and not only in this circumstance, but in a number of effectual characteristics, they differ from the pilori, or musk rat of the Antilles.

The ondatra is of the size of a small rabbit, and of the form of a rat. Its head is short, and similar to that of the water-rat ; its hair is soft and glossy, with a very thick down underneath, nearly like that of the beaver ; its tail is long, and though of a different form, covered nevertheless with little scales, in the same manner as those of other rats.

Its ears are very short, but not uncovered, like those of the domestic rat ; being furnished with hair, both outwardly and inwardly.

The striking singularities which have been remarked in the ondatra, are, first, the force and great expansion of the muscles of the skin, which enables the animal, by contracting its skin, to compress its body, and reduce it to a smaller size ; secondly, the suppleness of the false ribs, which permits a contraction of the body so considerable, that the musk-rat is known to obtain an easy entrance into holes too narrow for the admission of animals much smaller than itself ; thirdly, the manner in which the female voids her urine, the urethra not terminating as in other quadrupeds, but at a hairy eminence situated over the os pubis ; fourthly, the testes, which, as in other rats, are situated on each side of the anus, become prodigiously large while the ardour for propagation lasts ; and lastly, we learn, that the vessels which contain the musk or perfume of this animal, under the form of a milky humour, and which adjoin to the parts of generation, under the same changes ; that, during the rutting season, they enlarge and swell to a very great degree ; that then the perfume is exceedingly strong, and sensibly to be distinguished at a considerable distance ; but that, at the expiration of this period, they become wrinkled, they decay, and are at length totally effaced. The change in the bags which contain the perfume is effected more quickly, as well as more completely, than that of the parts

of generation. They are common to both sexes, and contain a very copious milky substance, while the animals are actually in heat.

As the ondatra belongs to the same country as the beaver; as, like that animal, it is fond of water: and as, though smaller, it has yet nearly the same figure, the same colour, the same kind of hair, they have been often compared with each other.

In disposition and instinct also, these animals bear a considerable resemblance to each other. Like the beavers, the ondatras live in society during the winter. They form little dwellings, about two feet and a half, and sometimes more in diameter; and in these there is often found an association of several families. To such habitations they do not resort in order to sleep for five or six months, like the marmots; their only object is, to obtain from them a shelter from the inclemency of the weather. They are of a round form, and are covered with a kind of dome about a foot thick. The materials of which they are composed are rushes and certain herbs interweaved together, and consolidated with some clay, which they previously prepare for that purpose with their feet.

These animals breed once a year, and generally produce five or six at a time. So strong are their fore-teeth, and so excellently calculated for gnawing, that, when one of them is shut up in a box, it presently makes a hole to escape through, let the wood be ever so hard.

These animals are little inclined to ferocity, and, when taken young, are easily tamed. In the very early period of life they are also, which might not be expected, exceedingly handsome; for then the long, and almost uncovered tail, which renders their figure very disagreeable afterwards is very short. They play with all the innocence and sprightliness of young cats; they never bite, and with ease might be reared, were it not for the circumstance of their noxious smell.

CHAP. XV.

Of the Peccary, or Mexican Hog—Of the Ternat Bat—The Spectre—The Flying Squirrel—The Grey Squirrel—The Palm Squirrel, and those of Barbary, &c.—The Ant-eaters—The short and long-tailed Manis—The Armadillo—The spotted Cavy—The Opossum—The Marmose—The Cayopolin.

THE PECCARY, OR MEXICAN HOG.

AMONG the animals of the New World, we meet with few species more numerous, or more remarkable, than that of the peccary, or Mexican hog. At the first glance, this animal resembles our wild boar, or rather the hog of Siam, which, as we have already observed, is, like our domestic hog, nothing more than a variety of the wild boar, or wild hog; and for this reason it has been called the boar or hog of America. The peccary, however, is of a distinct species, and differs from the hog in a number of characteristics, both external and internal. It is less corpulent, and its legs are shorter; in the stomach and intestines there is a difference of conformation; it has no tail, and its bristles are much stronger than those of the wild boar; and, lastly, it has, upon that part of the back which borders upon the buttocks, an opening from which there is discharged an ichorous humour of a very disagreeable smell. The peccary is the only animal which has an opening in this region of the body. In the civets, the badger, and the genett, the reservoir for the perfume is situated beneath the parts of generation; and in the musk animals we find it under the belly.

The peccary may be rendered a domestic animal, like the hog, and has, pretty nearly, the same habits and natural inclinations. It feeds upon the same aliments; and its flesh, though more dry and lean than that of a hog, is not unpalatable.

These animals are extremely numerous in all the parts of South America. They generally go in herds of two or three hundred together, and unite, like hogs, in the defence of each other. They are particularly fierce when their young are attempted to be taken from them. They surround the plunderer, attack him without fear, and frequently make his life the forfeit of his rashness.

In its native country, the peccary is rather fond of the mountainous parts than of the low and level grounds; it seems to delight neither in the marshes, nor the mud, like our hogs; it keeps among the woods, where it subsists upon wild fruits, roots, and vegetables; it is also an uncreasing enemy to the lizard, the toad, and all the serpent kinds with which the uncultivated forests of the New Continent abound. As soon as it perceives a serpent, or a viper, it at once seizes it with its fore hoofs and teeth, skins it in an instant, and devours the flesh.

The peccary, like the hog, is very prolific; the young ones follow the dam, and do not separate from her till they have come to perfection. If taken at first, they are very easily tamed, and soon lose all their natural ferocity; they, however, never display any remarkable signs of docility. They only continue to do no mischief; and they may be permitted to run tame, without apprehending any dangerous consequences. They seldom stray far from home; they return of themselves to the sty, and do not quarrel among each other, except when they happen to be fed in common. When enraged they draw their breath with great force, and their bristles point upward; nor on such occasions, can these be said so much to resemble the bristles of the wild boar as the sharp armour of the hedge-hog.

THE ROUSSETTE, OR GREAT TERNAT BAT,* THE ROUGETTE, OR LESSER TERNAT BAT,† and the VAMPIRE, OR SPECTRE.‡] The roussette, and the rougette, seem to form two distinct species, which, however, are so full of resemblances to each other, that they ought not to be presented asunder. The latter differs from the former solely in the size of the body, and the colours of the hair. The roussette, whose hair is of a reddish brown, is in length nine inches, from the tip of the nose to the insertion of the tail, and in breadth three feet, when the membranes, which serve it for wings, are fully extended. The rougette, whose hair is of a reddish ash-colour, is hardly more than five inches and a half in length, and two feet in breadth; and its neck is half-encircled with a stripe of hair of a

* Vulgarly called the *flying dog*, and, by the generality of naturalists, the *great bat of Madagascar*.

† Vulgarly called the *red necked flying dog*.

‡ An American animal, which has hitherto been solely indicated under the vague names of the *great American bat*, or *flying dog of New Spain*.

lively red, intermixed with orange-colour, of which we perceive no vestige on the neck of the roussette. They both belong nearly to the same hot climates of the Old Continent. We meet with them in Madagascar, in the island of Bourbon, in Ternat, in the Philippine and other islands of the Indian Archipelago, where, indeed, they seem to be more common than in the neighbouring continents.

In the hotter countries of the New World, we likewise meet with another flying quadruped, of which we know not the American name, but to which I will affix the denomination of spectre, or vampyre, because it sucks the blood of men, and of animals, while they are asleep, without causing even sufficient pain to awake them. This American animal is of a species different from those of the roussette and the rougette, which are both to be found solely in Africa, and in the southern parts of Asia.

The spectre is smaller than the rougette, which is itself smaller than the roussette. The former, when it flies, seems to be of the size of the pigeon; the second of the size of a raven; and the third of the size of a large hen. Of both the roussette, and the rougette, the head is tolerably well shaped; the ears are short, and the nose is very round, and nearly in form like that of a dog. Of the spectre, on the contrary, the nose is more elongated; the aspect is as hideous as that of the ugliest bats; the head is unshapely, and the ears large, very open, and very straight; its nose is disfigured; its nostrils resemble a funnel, and have a membrane at the top, which rises up in the form of a sharp horn, or cock's comb, and greatly heightens the deformity of its face.

There is no doubt, therefore, but that the species of the spectre is different from those of the roussette and the rougette. It is an animal not less mischievous than it is deformed; it is the pest of man, the torment and destruction of animals. In confirmation of this truth, a more authentic testimony cannot be produced than that of M. de la Condamine. "The bats," says he, "which suck the blood of horses, of mules, and even of men, when they do not guard against it by sleeping under the shelter of a pavilion, are a scourge common to most of the hot countries of America. Of these there are some of a monstrous size. At Borja, and several other places, they have entirely destroyed the large cattle which the missionaries had brought thither, and which had begun to multiply."

The roussette and rougette are larger, stronger, and perhaps yet more mischievous than the vampyre; but it is by open force, and in the day as well as in the night, that they commit hostilities. Fowls and small animals are the objects of their destructive fury; they even attack men, and bite their faces most cruelly; but no traveller has accused them of surprising men and animals, while asleep, and of taking such opportunities to suck their blood.

All these bats are animals carnivorous, voracious, and possessed of an appetite for every thing that offers. In a dearth of flesh or fish, they feed on vegetables and fruits of every kind. As they are fond of the juice of the palm tree, so it is easy to take them by placing in the neighbourhood of their retreat a few vessels filled with palm-tree water, or any other fermented liquor, with which they intoxicate themselves. They fasten to, and suspend themselves from trees with their claws. They are usually seen in troops, and more so by night than by day; places which are much frequented they shun; and their favourite residence is in the deserted parts of islands.

I have frequently thought it worth while to examine how it is possible that these animals should suck the blood of a person asleep, without causing, at the same time, a pain so sensible as to awake him. Were they to cut the flesh with their teeth, or with their claws, the pain of the bite would effectually rouse any of the human species, however soundly asleep. With their tongue only, then, it is possible for them to make such minute apertures in the skin, as to imbibe the blood through them, and to open the veins without causing an acute pain.

The tongue of the vampyre I have not had an opportunity to observe; but that of several roussettes, which Mr. Daubenton has attentively examined, seems to indicate the possibility of the fact. It is sharp, and full of prickles directed backward; and it appears, that these prickles, or points, from their exceeding minuteness, may be insinuated into the pores of the skin, may enlarge them, and may penetrate them so deep, as to command a flow of the blood by the continued suction of the tongue. But we can only conjecture upon a fact of which all the circumstances are imperfectly known to us, and of which some are perhaps exaggerated or erroneously related, by the writers who have transmitted them to us.

THE FLYING SQUIRREL is of a particular species, and resembles in few particulars either the squirrel or the rat.

He is more common in America than in Europe, where he is seldom seen, except in Lithuania and Russia. This little animal dwells upon trees, like the squirrel; he goes from branch to branch; and when he leaps upon another tree, his skin, which hangs loose on both sides of his body, is stretched forward by his fore-legs, and backward by the hind-legs, and encreases the surface of his body, without adding to its weight, and consequently retards his fall; so that this animal reaches, in one leap, a great distance. This motion is not like the flight of a bird, neither like the fluttering of a bat; both which motions are performed by striking the air with repeated vibrations. It is one single leap, caused by the first impulse, the motion of which is only prolonged, and lasts longer, as the body of the animal, presenting to the air greater surface, finds a greater resistance, and falls more slowly.

The flying squirrel is easily tamed; but it often flies; and he must be kept in a cage, or tied with a small chain. He feeds upon bread, fruit, seeds; he is remarkably fond of the buds and shoots of the birch and pine trees. He does not seek after nuts and almonds, like the squirrel. He makes a bed of leaves, in which he buries himself, and upon which he lies in the day time, and leaves it in the night, or when pressed by hunger. As he has little agility, he becomes easily the prey of martins, and other animals, which climb up the trees; so that the species is not greatly multiplied, although they have commonly three or four young at a time.

THE GREY SQUIRREL is found in the northern parts of both continents. He is in shape like a common squirrel; the outward difference consists in his size; he is larger than squirrels generally are; the colour of his hair is not red, but light, or deep grey; and his ears are not so hairy towards the extremity, as those of our squirrels. Many authors think the species is different in Europe and America; that the grey squirrels of Europe are of the common kind, and that they change their colour according to the season, in the northern climates. Without denying absolutely this assertion, which does not seem sufficiently proved, we look upon the grey squirrel of Europe and America as the same animal, and as a distinct species, separated from that of common squirrels, who are found in the northern parts of both continents, being of the same size and of the same colour; that is, of a red, more or less bright, according to the temperature of the country.



Fig. 1. Squirrel in the Tree. Fig. 2. Squirrel on the Ground. Fig. 3. Squirrel on the Ground.

We have very little information with regard to the grey squirrel. Fernandez says, that the grey, or blackish squirrel of America dwells commonly upon trees, particularly pines; that he feeds upon fruits and seeds; that he provides his provision for the winter, and heaps it up in some hollow tree, where he retires during the winter. The grey squirrel also differs from the others in making his nest at the top of trees like birds.

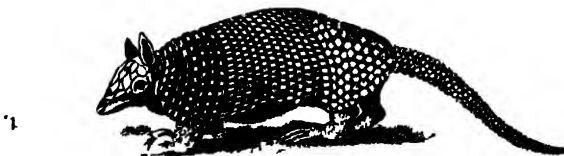
THE PALM-SQUIRREL, AND THOSE OF BARBARY AND SWITZERLAND.] The palm-squirrel is as large as a rat, or a small squirrel; he lives upon the palm-trees, from which he takes his name: some call him the palmist rat, and others the palm-tree squirrel, we shall call him palmist. His head is very near of the same form as that of the short-tailed field-mouse, and covered with rough hair; his long tail does not lie on the ground, like that of the rat: he carries it erect vertically, without however laying it on his body, as the squirrel, it is covered with hair longer than that of his body, but much shorter than the hair of the squirrel's tail: his back is variegated with white and brown stripes, which distinguish the palmist from all other animals, except the squirrel of Barbary and Switzerland.

As for the squirrel of Barbary, as he is of the same continent, and of the same climate, of the same size, and very near the same form as the palmist, one should be inclined to think, that they are both of the same species, with some variety; yet there is still reason to believe them different animals. The squirrel of Barbary has the head and forehead more crooked, the ears longer, the tail more bushy than the palmist; he is more like a rat than a squirrel. The squirrel of Barbary has four white stripes, and the palmist has no more than three: the white stripe is on the palmist's backbone; on the contrary, that of the squirrel of Barbary on the same part of his body is brown and red. These animals, indeed, have very nearly the same habits, and are of the same nature as the common squirrel. They are both of an elegant form; their coat with white stripes is more valuable than that of the squirrel; their shape is shorter, their body lighter, and their motions quicker. The palmist, and the squirrel of Barbary, dwell on trees like the common squirrel, but the Swiss squirrel lives upon earth, and, like the field-mouse, forms a retreat that the water cannot penetrate; he is also less docile and less gentle than the two others: he bites without mercy, (except he is lately tamed:)

he is more like a rat, or a field-mouse, than a squirrel, by instinct and nature.

THE TAMANOIR, THE TAMANDUA AND THE FOUR-MILLER, OR ANT-EATER.] South America produces three species of animals, with a long snout, a small mouth, and no teeth; their tongues, of a round form, are remarkably long; with which they penetrate into the ants nests, and draw out the ants, which is their principal food. The first of these ant-eaters is that which the Brasilians call tamandua guacu, or great tamandua, to whom the French settled in America have given the name of tamanoir. This animal is about four feet in length from the extremity of the snout to the origin of the tail; his head is fourteen or fifteen inches long, his snout stretches out to a great length; his tail two feet and a half long, is covered with rough hair, which is more than a foot in length; his neck is short, his head narrow, his eyes black and small, his ears round, his tongue thin, more than two feet long, which he folds again in his mouth, after he draws it entirely out. His legs are but one foot high; the fore-legs are a little higher and more slender than those behind: he has round feet; the fore-feet are armed with four claws, the two middle ones are the longest; those behind have five claws. The hair of his head and body is black and white; this animal turns his tail up on his back, and covers with it his whole body, when he is inclined to sleep, or wants to shelter himself from the rain or the heat of the sun. The long hair of his tail and of his body is not round in all its extent; it is flat towards the end, and feels like dry grass. He waves his tail frequently and hastily when he is irritated, but it hangs down when he is composed, and he sweeps the way with it as he goes. The tamanoir walks slowly; a man can easily overtake him in running: his feet seem less calculated to walk than to climb, and to fasten round bodies; and he holds so fast a branch or a stick, that it is not possible to snatch either from him.

The second of these animals is that which the Americans call tamandua. He is much smaller than the tamanoir; he is not above eighteen inches from the extremities of the snout to the rump: his head is five inches long, his snout crooked, and underneath flat and long: he has a tail ten inches long, without hair at the end; his ears are erect, and about an inch in length; his tongue is round, eight inches long, and placed in a sort of gutter or hollow



1. Great Horned Owl. — 2. Tamandua. — 3. Pangolin.
4. Armadillo.

canal within the lower jaw; his legs are not above four inches in height, his feet are of the same form, and have the same number of claws as the tamanoir. He climbs up and holds fast a branch, or a stick, like the tamanoir, and his march is equally slow. He does not cover himself with his tail, which cannot shelter him, being almost bare; the hair of the fore-part is shorter than that of the tamanoir; when he sleeps he hides his head under his neck and his fore-legs.

The third of these animals is that which the naturalists of Guiana call ouatirouaou; and the French fourmiller, or ant-eater. He is still much smaller than the tamandua, being not above six or seven inches in length from the extremity of the snout to the tail; his head is two inches long; the snout is not near so long as that of the tamanoir, or the tamandua; his tail is seven inches in length, is bent underneath, and bare at the end; his tongue is narrow, long, and flat; his neck is almost bare, the head is large, in proportion to the body, his eyes placed low, at a little distance from the corners of the mouth, his ears are small, and hidden by the hair; his legs are but three inches in height, the fore-feet have no more than two claws, the outward is much longer than the inward one; the hind-feet have four claws, the hair of the body is about nine inches long; he feels smooth, his colour is shining, diversified with red and yellow; his feet are not made to walk, but to climb up, and to take hold of branches of trees, on which he hangs himself by the extremity of his tail.

These three animals, so different in the size and proportions of the body, have, nevertheless, many things in common, as to conformation and their natural instinct. All three feed upon ants, and suck honey and other liquid and viscous substances; they gather quickly crumbs of bread and small pieces of meat; they are tamed and domesticated easily; they can subsist a long while without food; they do not swallow all the liquor which they keep in their mouth, one part of it issues out of their nostrils; they commonly sleep in the day time, and change their station in the night; they go so slowly, that a man may overtake them easily whilst running in open ground. The savages eat their flesh, which has, however, an unsavoury taste.

The tamanoir looks at a distance like a great fox, and for that reason some travellers call him the American fox: he is strong enough to defend himself against a large dog, and

even a jaguar; when he is attacked he fights standing on his hind-legs, like the bear, and makes use of his fore-claws, which are murdering weapons, for his protection; afterwards he lies on his back to use his hind-legs, and in this situation he is almost invincible, fights with obstinacy till the last extremity; and even after he has put his adversary to death, he keeps hold of him a long while. He is covered with long bushy hair, and a very thick skin; besides, his flesh is remarkably hard, and he seldom loses his life in these engagements.

The tamanoir, the tamandua, and the fourmiller, are natives of the hottest climates only of America; they are found in Brasil, in Guiana, and in the country of the Amazons, &c. they do not breed in Canada, nor in the other frozen regions of the New World, and do not belong consequently to the Ancient Continent.

THE PANGOLIN, AND PHATAGIN; OR THE SHORT AND LONG-TAILED MANIS.] These animals are commonly known under the name of scaly lizards; but we reject this denomination; 1st, because it is a compound; 2dly, because it is ambiguous, and applied to both species; 3dly, because it is wrongly imagined; these animals being not only of another kind, but even of another class than the lizards, which are oviparous reptiles, while the pangolin and the phatagin are viviparous quadrupeds.

All the lizards are wholly covered, even under the belly, with a sleek speckled skin, resembling scales, but the pangolin and the phatagin have no scales under their throat, on the breast, or the belly; the phatagin, like the other quadrupeds, has hair on all these under parts of the body; the pangolin has nothing but a smooth skin without hair. The scales with which all the other parts of the body of these two animals are clothed and covered, do not stick to the skin; they are only fixed and inherent to it underneath; they are moveable like the prickles of the porcupine. These scales are so large, so hard, and so sharp, that they frighten and discourage all animals of prey; it is an offensive armour which wounds while it resists.

The most cruel and the most voracious animals, such as the tiger and the panther, make but useless efforts to devour these armed animals; they tread upon them, roll them, but when they attempt to seize them they are grievously wounded; they can neither terrify them by violence, nor bruise, nor smother them with their weight.

When the pangolin and the phatagin contract themselves, they do not take, as the hedge-hog, a globular and uniform figure, they form an oblong coat of armour; but their thick and long tail remains outward, and encircles their bodies; this exterior part, by which it seems these animals might otherwise be seized, carries its own defence; it is covered with scales equally hard and sharp with those with which the body is clothed, and as it is convex above, and flat below, in the form of half a pyramid, the sides are covered with square scales folded in a right-angle, as thick and as sharp as the others, so that the tail seems to be still more strongly armed than the body, the under parts of which are unprovided with scales.

The pangolin, or short-tailed manis, is larger than the phatagin, or long-tailed kind; his fore-feet are covered with scales, but the phatagin's feet, and part of his fore-legs have none, being only clothed with hair. The pangolin has also larger scales, thicker, more convex, and not so close as those of the phatagin, which are armed with three sharp points; on the contrary, the scales of the pangolin are without points, and uniformly sharp. The phatagin is hairy upon the belly, and the pangolin has no hair on that part of his body, but between those scales which cover his back, some thick and long hair issues like the bristles of a hog, which are not found on the back of the phatagin.

The pangolin is from six to eight feet in length, including his tail; the tail is very near as long as the body, though it appears shorter when young; the scales are not then so large nor so thick, and of a pale colour, which is deeper when the animal is adult; they acquire such a hardness, that they resist a musket ball. Like the ant-eaters, the pangolin and the phatagin live chiefly upon ants: they have also a very long tongue, a narrow mouth, and without apparent teeth: their body and their tail are also very long, and the claws of their feet very near of the same length and the same form, but equal in number. The ant-eaters are found in America; the pangolin and the phatagin in the East Indies, and in Africa, where the Negroes call them quogelo: they eat their flesh, which they reckon a delicate, wholesome food; they also use their scales for different purposes. The pangolin, and the phatagin have nothing forbidding but their figure; they are gentle, harmless, and innocent; they feed upon insects only; they never run fast, and can only escape the pursuit of men by hiding themselves in hollow rocks, or, in holes which they dig for themselves;

they are two extraordinary species, not numerous, nor very useful: their odd form seems to place them as an intermediate class betwixt the quadrupeds and the reptiles.

THE ARMADILLO.] When a quadruped is mentioned, the very same carries the idea of an animal covered with hair; and yet nature, as if willing to deviate from this characteristic uniformity, very frequently astonishes us by uncommon productions. The quadruped animals, which we look upon as the first class of living nature, and who are, next to man, the most remarkable beings of this world, are not superior in every thing, nor separated by constant attributes. The first of these characters, which constitutes their name, and which consists in having four feet, is common to lizards, frogs, &c. which, however, differ from the quadrupeds in many other respects, so as to make a separate class from them. The second general property, to produce young alive, is not peculiar to quadrupeds, since it is common with whales and other fishes of that class. And the third attribute, that of being covered with hair, exists not in several species, which cannot be excluded from the class of the quadrupeds, since, this characteristic excepted, they agree with them in all other respects.

Under the general name of armadillo we may reckon several species which seem to us really distinct; in all of them the animal is protected by a crust resembling bone; it covers the head, the neck, the back, the flanks, the buttocks, and the tail to the very extremity. This crust is covered outwardly by a thin skin, sleek and transparent: the only parts that are not sheltered by this buckler are the throat, the breast, and the belly, which presents a white grainy skin, like that of a plucked fowl; and, in considering these parts with attention, you will perceive the appearance of scales which are of the same substance as the crust. This crust is, however, not of one piece, as that of the turtle; it consists of several joined to each other by as many membranes, which put this armour in motion. The number of these natural bands does not depend on the age of the animal; for the young armadillo and the adults have in the same species the same number. Father d'Abbeville has distinguished six species of the armadillo, but the principal difference between them consists in the number of bands or divisions in the armour of the different species.

The armadilloes in general are innocent, harmless animals; if they can penetrate into gardens they will eat melons, potatoes, pulse, and roots. Though used originally to the hot climates of America, they live in temperate regions: I saw formerly one in Languedoc, which was fed at home, and went every where without doing any damage or mischief; they walk quickly, but they can neither leap, run, nor climb up trees; so they cannot escape by flight: they have then no other resources but to hide themselves in their holes, or, if they are at too great a distance from their subterraneous habitations, they contrive to dig one before they are overcome; for the mole is not more expert in digging the ground. They are sometimes caught before they are out of sight, and they make then such a resistance, that the tail is broken without bringing out the body: in order to take them without mutilation, the burrow must be opened, they are then caught without making any resistance: when they find themselves in the hand of their pursuers they roll themselves up into a ball, and are placed near the fire, to force them to stretch out their coat of mail; which, hard as it is, as soon as it is touched with the finger the animal receives so quick an impression, that he contracts instantaneously. When they are in deep burrows, the method of forcing them out is to smoke them, or to let water run down the hole: some pretend, they remain underground above three months without venturing out; it is true, that they remain in their holes in the day-time, and never go out but in the night to seek for their subsistence. The armadillo is hunted with small dogs, who soon overtake him; but he stops before they have reached him, and contracts himself; in this condition he is taken and carried off. If he finds himself on the brink of a precipice, he escapes the dogs and the hunters by rolling himself up, and letting himself fall down like a ball, without injury or prejudice to his scales.

These animals are fat, and very prolific; the female brings forth, as it is reported, four young ones every month, which makes their species very numerous. They are good to eat, and are easily taken with snares laid for them on the banks of rivers, and in the marshy grounds, which they inhabit in preference. It is pretended, that they are not afraid of the bite of the rattle snake: it is likewise pretended, that they live in peace with these reptiles, which are often found in their holes. The savages apply their scales to different purposes, and make of them baskets, boxes, and other small

vessels light and solid, The armadillo is only found in South America.

THE PACA, OR SPOTTED CAVY, is an animal of the New World, who digs a burrow like a rabbit, to which he has been compared, though there is scarcely any likeness between these two animals: he is much larger than the rabbit, and even than the hare; he has a round head, and the snout short; he is fat and bulky, and by the form of his body, he is more like a pig, as well as by grunting, waddling, and the manner of eating; for he does not use, as the rabbit does, his fore-feet to carry food to his mouth, but grubs up the earth like the hog, to find his subsistence. These animals inhabit the banks of rivers, and are found in damp and hot places of South America: the flesh is very good to eat, and excessively fat, their skin also is eaten as that of a pig; a perpetual war is therefore carried on against these animals. Hunters find it very difficult to take them alive; and when they are surprised in their burrows, which have two openings, they defend themselves, and bite with great rage and inveteracy. Their skin, though covered with short and rough hair, is valuable, because it is spotted on the sides. These animals bring forth young in abundance: men, and animals of prey, destroy a great quantity of them, and yet the species is still numerous. They are peculiar to South America, and are found nowhere in the Old Continent.

THE OPOSSUM is an animal of America, which is easily distinguished from all others by two singular characters: the first is, that the female has under the belly a large cavity, where she receives and suckles her young; the second is, that the male and the female have no claws on the great toe of the hind-feet, which are separated from the others, as the thumb in the hand of a man, whilst the other toes are armed with crooked claws, as in the feet of other quadrupeds.

The opossum is not found in the northern parts of the New World; but he does not constantly dwell in the hottest climates. He is found not only in Brazil, Guiana, and Mexico, but also in Florida, Virginia, and other temperate regions of this continent. It produces often, and a great number of young each time. Most authors say, four or five young; others, six or seven. Marcgrave affirms, that he has seen six young living in the bag of the



1. Pau 2. female Opposum - 3. female Opposum
 4. Halle Opposum - 5. Halle Opposum 6. Hal. M.

female; they were about two inches in length, they were already very nimble, they went in and out of the bag many times in a day; they are still smaller when they are just brought forth. Some travellers say, that they are not larger than flies when they go out of the womb into the bag, and stick to the paps: this fact is not so much exaggerated as some people may imagine, for we have seen ourselves in an animal, whose species is like that of the opossum, young ones sticking to the paps not larger than a bean; and we may presume, without improbability, that in these animals the womb is only the place of conception, of the formation, and first unfolding of the foetus, which increases in the bag.

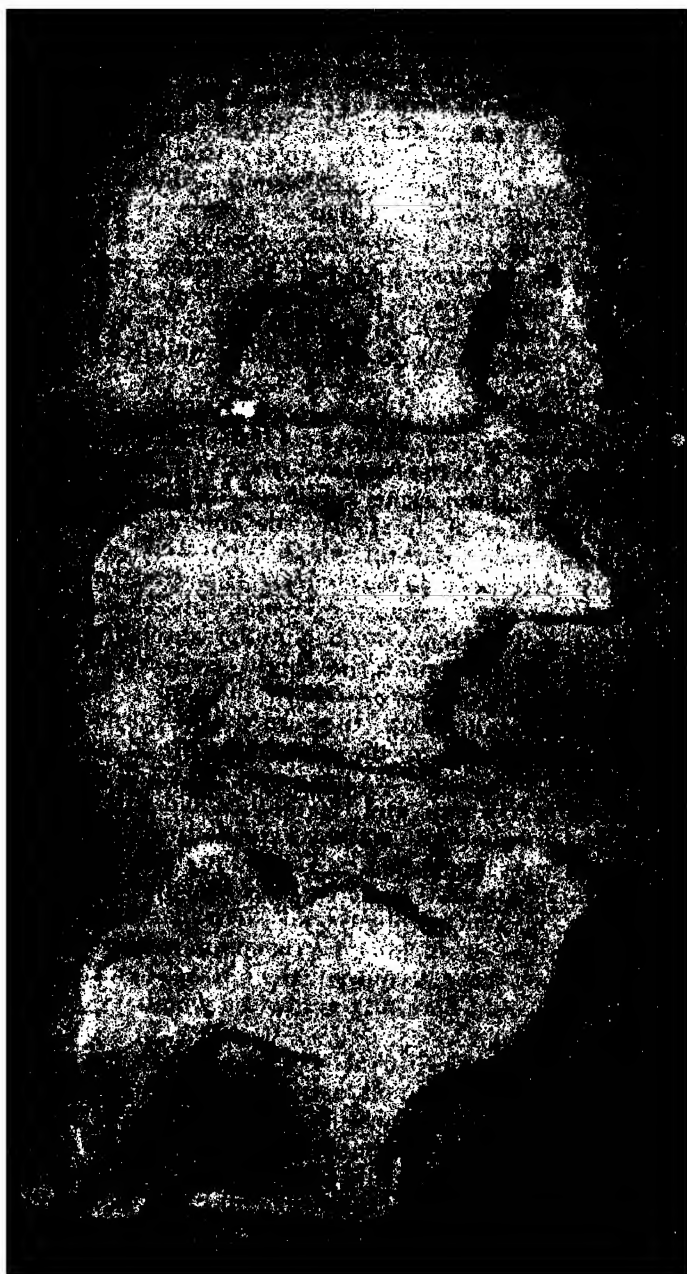
The young opossum sticks to the paps of the mother till they have acquired strength enough, and a sufficient growth to move easily. This fact is not doubtful, nor even particular in this species only. Some authors pretend, that they stick to the paps for several weeks; others say, that they remain in the bag only the first month after they go out of the womb. One may open with facility this bag, observe, count, and even feel the young without disturbing them; they will not leave the pap, which they hold with their mouth, until they are strong enough to walk: then they let themselves fall into the bag, and go out and seek for their subsistence; they go in again to sleep, to suckle, and to hide themselves when they are terrified; when the mother flies, and carries in it the young, her belly does not seem bigger when she breeds than common, for in the time of true gestation it is scarcely perceivable that she is with young.

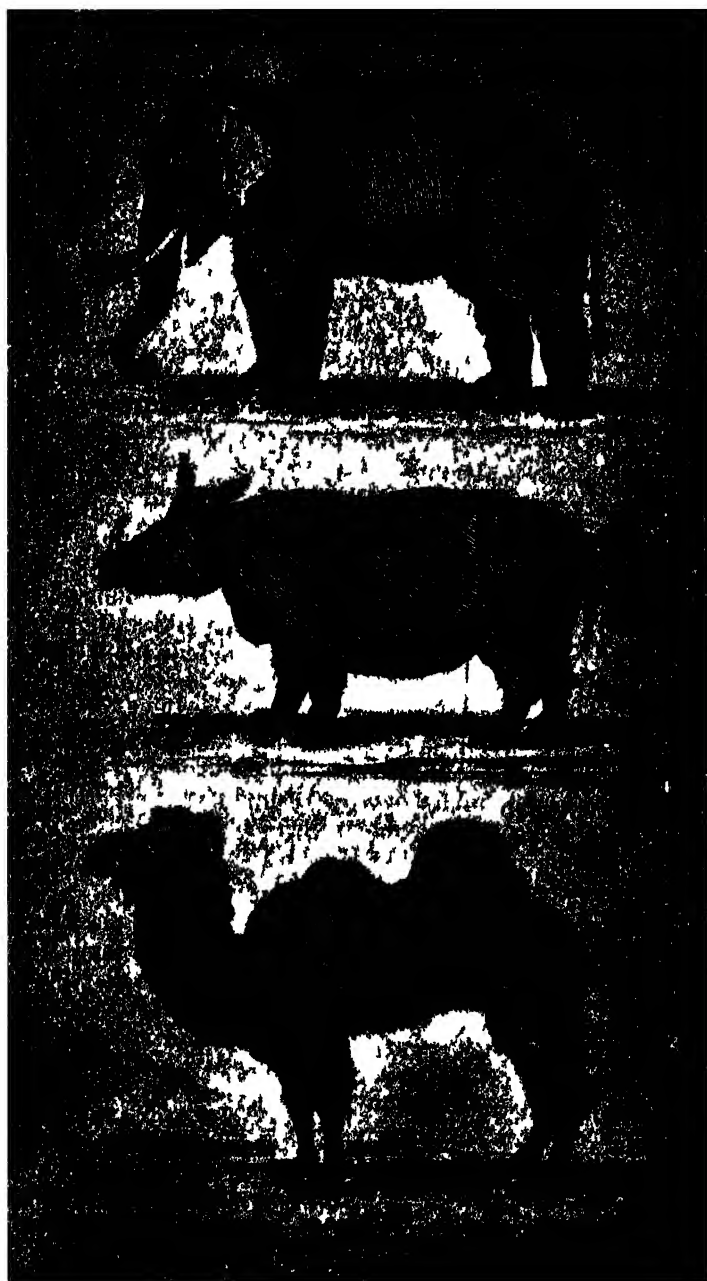
From the mere inspection of the form of the feet of this animal, it is easy to judge that he walks awkwardly, and seldom runs: a man can overtake him without hastening his steps. He climbs up trees with great facility, hides himself in the leaves to catch birds, or hangs himself by the tail, the extremity of which is muscular, and flexible as the hand, so that he may squeeze, and even incurvate all the bodies he seizes upon: he sometimes remains a long while in this situation without motion; his body hangs with his head downward, when he silently waits for his prey; at other times, he balances himself to jump from one tree to another like the monkeys with like muscular and flexible tails, which he resembles also in the conformation of the feet. Though he is voracious, and even greedy of blood, which he sucks with avidity, he feeds also upon rep-

flies, insects, sugar-canes, potatoes, roots, and even leaves and bark of trees. He may be fed as a domestic animal; he is neither wild nor ferocious; he is easily tamed, but he creates disgust by his bad smell, stronger and more offensive than that of the fox; his figure is also forbidding; for independently of his ears, which resemble those of an owl, of his tail, which resembles that of a serpent, and of his mouth, which is cleft to the very eyes, his body appears always very dirty, because his hair is neither smooth nor curled, but tarnished, as if covered with dirt. The bad smell of this animal resides in the skin, for his flesh is eatable. The savages hunt this animal, and feed on his flesh heartily.

THE MARMOSE, OR MURINE OPOSSUM, resembles in most respects the latter species; they are natives of the same climate, in the same continent, and are very much alike by the form of the body, the conformation of the feet, and the tail, a part of which is covered with scales, the upper part only being hairy. But the marmose is smaller than the common opossum, his snout is still sharper; the female has no bag under the belly, she has only two loose skins near the thighs, between which the young place themselves to stick to the paps. When the young are brought forth, they are not so large as small beans, they then stick to the paps. The brood of the marmose is very numerous; we have seen ten small marmoses, each sticking to a pap, and the mother had still four more paps. It is probable that these animals bring forth a few days after the conception. The young are then ~~fetus~~ only, which are not come to the fourth part of their growth. The mother always miscarries, and the ~~for~~uses save their lives in sticking to the paps, without leaving them till they have acquired the growth and strength which they would naturally get in the womb.

THE CAYOPOLLIN, OR MEXICAN OPOSSUM, says Hernandez, is a small animal, a little larger than a rat, very much resembling the opossum in the snout, the ears, and the tail, which is thicker and stronger than that of a rat; he makes use of it, as we do our hands; he has thin transparent ears; the belly, the legs, and feet white. The young, when they are frightened, embrace the mother, who lifts them up on the trees. This species has been found on the mountains of New Spain.





CHAP. XVI.

Of the Elephant—The Rhinoceros—The Camel and Dromedary—The Buffalo, the Urus, the Bison, and the Zebu.

THE ELEPHANT.

THE human race excepted, the elephant is the most respectable of animals. In size he surpasses all other terrestrial creatures, and in understanding he is inferior only to man. Of all the brute creation, the elephant, the dog, the ape, and the beaver, are most admirable for their sagacity; but the genius of the dog is only borrowed, being instructed by man in almost every thing he knows; the monkey has only the appearance of wisdom, and the beaver is only sensible with regard to himself, and those of his species. The elephant is superior to them all three; he unites all their most eminent qualities. The hand is the principal organ of the monkey's dexterity; the elephant with his trunk, which serves him instead of arms and hands, with which he can lift up, and seize the smallest, as well as the largest objects, carry them to his mouth, place them on his back, hold them, or throw them far off, has the same dexterity as the monkey, and at the same time the tractableness of the dog; he is like him susceptible of gratitude, capable of a strong attachment; he uses himself to man without reluctance, and submits to him, not so much by force, as by good treatment; he serves him with zeal, intelligence, and fidelity; in fine, the elephant, like the beaver, loves the society of his equals, and makes them understand him. They are often seen to assemble together, disperse, act in concert, and if they do not erect buildings, and do not work in common, it is, perhaps, for want of room only, and tranquillity; for men have very anciently multiplied in all the regions inhabited by the elephant; he consequently lives in fear and anxiety, and is no where a peaceful possessor of a space large and secure enough to establish his habitation on a settled spot. Every being in nature has his real price, and relative value; to judge of both in the elephant, we must allow him at least the judgment of the beaver, the dexterity of the monkey, the sentiment of the dog, and to add to these qualifications the peculiar advantages of strength, size, and longevity.

We must not forget his arms, or his defence, with which he can pierce through, and conquer the lion. We must observe, that he shakes the ground at every step; that with his trunk he roots up trees; that with the strength of his body he makes a breach in a wall; that being terrible by his force, he is invincible by the resistance only of his enormous mass, and by the thickness of the leather which covers it; that he can carry on his back a tower armed in war, with a number of men; that he alone moves machines and carries burthens, which six horses cannot move. To this prodigious strength he joins courage, prudence, coolness, and an exact obedience; he preserves moderation even in his most violent passion: he is more constant than impetuous in love; in anger he does not forget his friends, he never attacks any but those who have given him offence; he remembers favours as long as injuries: having no taste for flesh, and feeding chiefly upon vegetables, he is not naturally an enemy to other animals; he is beloved by them all, since all of them respect him, and have no cause to fear him. For these reasons, men have had at all times a veneration for this great, this first of animals. The ancients considered the elephant as a prodigy, a miracle of nature; they have much exaggerated his natural faculties; they attribute to him, without hesitation, not only intellectual qualities, but moral virtues.

In a wild state, the elephant is neither bloody nor ferocious; his manners are social; he seldom wanders alone; he commonly walks in company, the oldest leads the herd the next in age drives them, and forms the rear; the young and the weak are in the middle. The females carry their young, and hold them close with their trunks. They only observe this order, however, in perilous marches, when they go to feed on cultivated lands: they walk or travel with less precaution in forests and solitary places, but still keeping at such a moderate distance from each other, as to be able to give mutual assistance, and seasonable warnings of danger. Some, however, straggle, and remain behind the others; none but these are attacked by hunters, for a small army would be requisite to assail the whole herd, and they could not conquer without a great loss of men; it is even dangerous to do them the least injury, they go strait to the offender, and notwithstanding the weight of their body they walk so fast that they easily overtake the lightest man in running; they pierce him through with their tusks, or seize him with their trunks, throw him against a stone, and tread him under their feet; but it is only when

they have been provoked, that they become so furious and so implacable. It is said, that when they have been once attacked by men, or have fallen into a snare, they never forget it, and seek for revenge on all occasions. As they have a more exquisite sense of smelling, perhaps more perfect than any other animal, owing to the large extent of their nose, they smell a man at a great distance, and could easily follow him by the track. These animals are fond of the banks of rivers, deep valleys, shady places, and marshy grounds; they cannot subsist a long while without water, and make it thick and muddy before they drink; they often fill their trunks with it, either to convey it to their mouth, or only to cool their nose, and to amuse themselves in sprinkling it around them; they cannot support cold, and suffer equally from excessive heat, for to avoid the burning rays of the sun, they penetrate into the thickest forests; they also bathe often in the water; the enormous size of their body is rather an advantage to them in swimming, and they do not swim so deep in the water as other animals; besides, the length of their trunk, which they erect, and through which they breathe, takes from them all fear of being drowned.

Their common food is roots, herbs, leaves, and young branches; they also eat fruit and corn, but they have a dislike to flesh and fish. When one of them finds abundant pasture, he calls the others, and invites them to come and feed with him. As they want a great quantity of fodder they often change their place, and when they find cultivated lands they make a prodigious waste; their bodies being of an enormous weight, they destroy ten times more with their feet than they consume for their food, which may be reckoned at the rate of one hundred and fifty pounds of grass daily. As they never feed but in great numbers, they waste a large territory in about an hour's time; for this reason, the Indians and the Negroes take great pains to prevent their visits, and to drive them away, by making a great noise, and great fires; notwithstanding these precautions, however, the elephants often take possession of them, drive away the cattle and men, and sometimes pull down their cottages. It is difficult to frighten them, as they are little susceptible of fear; nothing can stop them but fire-works, and crackers thrown amongst them, the sudden effect of which, often repeated, forces them sometimes to turn back. It is very difficult to

part them, for they commonly attack their enemies all together, proceed unconcerned, or turn back.

The female elephant goes two years with young ; when she is in that condition the male never copulates with her. They only bring forth a young one, which has teeth as soon as brought forth, he is then larger than a boar ; yet his tusks are not visible, they appear soon after, and at six months old, are some inches in length ; at that age, the elephant is larger than an ox, and the tusks continue to increase till he is advanced in years.

It is very easy to tame the elephant. As he is the strongest and most rational of animals, he is more serviceable than any of them ; but he seems to feel his servile condition, for he never couples or generates in a domestic state.

There is, therefore, no domestic elephant but has been wild before, and the manner of taking, taming, and bringing them into submission, deserves particular attention. In the middle of forests, and in the vicinity of the places which they frequent, a large space is chosen, and encircled with pallisadoes ; the strongest trees of the forest serve instead of stakes, to which cross pieces of timber are fastened, which support the other stakes ; a man may easily pass through this pallisado ; there is another great opening, through which the elephant may go in, with a trap hanging over it, or a gate which is shut behind him : to bring him to that inclosure, he must be enticed by a tame female, ready to take the male ; and when her leader thinks she is near enough to be heard, he obliges her to indicate by her cries the condition she is in ; the wild male answers immediately, and begins his march to join her ; she repeats her call now and then, and arrives first to the first inclosure, where the male following her track, enters through the same gate. As soon as he perceives himself shut up, his ardour vanishes, and when he discovers the hunters, he becomes furious ; they throw at him ropes with a running knot to stop him ; they fetter his legs and his trunk, they bring two or three tame elephants, led by dexterous men, and try to tie them with the wild elephant, and at last, by dint of dexterity, strength, terror, and caresses, they succeed in taming him in a few days.

The elephant once tamed, becomes the most tractable and the most submissive of all animals ; he conceives an affection for his leader, he caresses him, and seems to guess whatever can please him : in a little time he understands

the signs, and even the expression of sounds ; he distinguishes the tone of command, that of anger or good-nature, and acts accordingly : he never mistakes the words of his master ; he receives his orders with attention, executes them with prudence and eagerness, without precipitation ; for his motions are always measured, and his character seems to participate of the gravity of his body ; he is easily taught to bend the knee to assist those who will ride on his back ; he caresses his friends with his trunk, and salutes with it the persons he is directed to take notice of ; he makes use of it to lift burdens, and helps to load himself ; he has no aversion to being clothed, and seems to delight in a golden harness or magnificent trappings ; he is easily put to the traces of carts, and draws ships upon occasion : he draws evenly, without stopping or any marks of dislike, provided he is not insulted by unseasonable correction, and provided his driver seems to be thankful for the spontaneous exertion of his strength. His leader is mounted on his neck, and makes use of an iron rod crooked at the end, with which he strikes him gently on the head to make him turn or increase his pace ; but often a word is sufficient, especially, if he has had time to make himself well acquainted with his leader, and has a confidence in him ; his attachment is sometimes so strong, and so lasting, and his affection so great, that commonly he refuses to serve under any other person, and he is known to have died of grief for having in anger killed his governor.

The species of the elephant is numerous, though they bring forth but one young one in two or three years ; the shorter the life of animals is, the more they multiply : in the elephant, the length of his life compensates the small number ; and if it is true, as has been affirmed, that he lives two hundred years, and that he begets when he is one hundred and twenty years old, each couple brings forth forty young in that space of time : besides, having nothing to fear from other animals, and little even from men, who take them with great difficulty, the species has not decreased, and is generally dispersed in all the southern parts of Africa and Asia.

From time immemorial the Indians made use of elephants in war. Amongst those nations unacquainted with the European military discipline, they were the best troop of their armies ; and as long as battles were decided by mere weapons, they commonly vanquished : yet, we see in history, that the Greeks and Romans used them-

themselves soon to those monsters of war; they opened their ranks to let them go through; they did not attempt to wound them, but threw all their darts against their leaders, who were forced to surrender, and to calm the elephants when separated from their troops; and now that fire is become the element of war, and the principal instrument of death, the elephants, who are afraid of the noise and the fire of the artillery, would be rather an incumbrance in battle, and more dangerous than useful.

In those regions, however, where our cannons and murdering arts are yet scarcely known, they fight still with elephants. At Cochin, and in the other parts of Malabar, they do not make use of horses, and all those who do not fight on foot are mounted upon elephants. In Tonquin, Siam, and Pegu, the king, and all the grandees, never ride but upon elephants: on festival days they are preceded and followed by a great number of these animals richly caparisoned, and covered with the richest stuffs. On comparing the relations of travellers and historians, it appears that the elephants are more numerous in Africa than in Asia; they are there also less mistrustful, not so wild, and, as if they knew the unskilfulness and the little power of the men with whom they have to deal in this part of the world, come every day without fear to their habitations.

In general, however, the elephants of Asia are of a larger size, and superior in strength to those of Africa; in particular, those of Ceylon, who exceed in courage and sagacity all those of Asia: probably they owe these qualifications to their education, more improved in Ceylon than any where else. The elephants of the Indies easily carry burdens of three or four thousand weight; the smallest, that is, those of Africa, lift up freely with their trunks burdens of two hundred pounds weight, and place them on their shoulders; they take in this trunk a great quantity of water, which they throw out around them, at seven or eight feet distance; they can carry burdens of more than a thousand weight upon their tusks; with their trunk they break branches of trees, and with their tusks they root out the trees. One may judge of their strength by their agility, considering at the same time the bulk of their body; they walk as fast as a small horse on the trot, and when they run, they can keep up with a horse on full gallop, which seldom happens in their wild state, except when they are provoked by anger, or frightened. The tame elephants travel easily, and without fatigue, fifteen or twenty leagues.

a day ; and when they are hurried, they may travel thirty-five or forty leagues. They are heard at a great distance, and may be followed very near on the track, for the traces which they leave on the ground are not equivocal ; and on the ground where the steps of their feet are marked, they are fifteen or eighteen inches in diameter.

When the elephant is taken care of, he lives a long while even in captivity. Some authors have written, that he lives four or five hundred years ; others, two or three hundred ; and the most credible, one hundred and twenty, thirty, and even one hundred and fifty years. Whatever care, however, is taken of the elephant, he does not live long in temperate countries, and still less in cold climates. The elephant which the king of Portugal sent to Louis XIV. in 1668, and which was then but four years old, died in his seventeenth, in January 1681, and lived only thirteen years in the menagery of Versailles, where he was treated with care and tenderness, and fed with profusion : he had every day four pounds of bread, twelve pints of wine, two buckets of porridge, with four or five pounds of bread, two buckets of rice boiled in water, without reckoning what was given to him by visitors ; he had, besides, every day one sheaf of corn to amuse himself ; for, after he had eaten the corn ears, he made a kind of whip of straw, and used it to drive away the flies ; he delighted in breaking the straw in small bits, which he did with great dexterity with his trunk ; and, as he was led to walk daily, he plucked the grass and eat it.

The common colour of the elephant is ash-grey, or blackish. The white are extremely scarce ; some have been seen at different times in the Indies, where also some are found of a reddish colour.

The elephant has very small eyes, comparatively with his enormous size, but they are sensible and lively : and what distinguishes them from all other animals, is their pathetic, sentimental expression. He seems to reflect, to think, and to deliberate ; and never acts till he has examined, and observed several times, without passion or precipitation, the signs which he is to obey. Dogs, the eyes of which have much expression, are animals too lively to distinguish their successive sensations ; but as the elephant is naturally grave and sedate, one may read in his eyes the order and outward appearance of his interior affections.

He has a quick hearing, and this organ is outwardly like that of smelling, more marked in the elephant than in

any other animal; his ears are very large, even in proportion to his body; they are flat, and close to the head, like those of a man; they commonly hang down, but he raises them up, and moves them with great facility; he makes use of them to wipe his eyes, and to cover them against the inconveniency of dust and flies. He delights in the sound of instruments, and seems to like music; he soon learns to beat time, and to move accordingly; he seems animated by the beat of the drum, and the sound of trumpets; he has an exquisite smell, and is passionately fond of perfumes of all sorts, and of fragrant flowers; he selects them one after another, and makes nosegays, which he smells with eagerness, and then carries them to his mouth as if he intended to taste them.

His sense of feeling centers in his trunk; but it is as delicate and as distinct in that sort of hand as in that of man: this trunk, composed of membranes, nerves, and muscles, is, at the same time, a member capable of motion, and an organ of sense: the animal can not only move and bend it, but he can shorten, lengthen, and turn it all ways. The extremity of this trunk terminates by an edge, which projects above like a finger; it is with this sort of finger that the elephant does whatever we do with ours; he picks up from the ground the smallest pieces of money; he gathers nuts and flowers, choosing them one after another; he unties knots, opens and shuts doors, turning the keys, and bolts them; he learns to draw regular characters with an instrument as small as a pen.

Although the elephant has a more retentive memory, and more intelligence than any other animal, he has the brain smaller than most of them: he is, at the same time, a miracle of intelligence, and a monster of matter; his body is very thick, without any suppleness; the neck is short and very stiff; the head small and deformed; the ears of an excessive diameter; and the nose is of a still more disproportionate length; the eyes are too small, as well as the mouth; his legs are like massive pillars, strait and stiff; the feet so short and so small, that he seems to have none; the skin is hard, thick, and callous. All these deformities are remarkable, as all of them are exhibited in large; and they are more disagreeable to the eye, as most of these deformities have no other example in the creation; no other animal having either the head, the feet, the nose, the ears, or the tusks, made or placed like those of the elephant.

The elephant is yet singular in the conformation of the feet; and the texture of the skin. He is not clothed with hair like other quadrupeds; his skin is bare; some bristles issue out of the chops; they are very thin on the body, and thicker on the eye-lids, on the back part of the head, within the ears, the thighs and the legs. The epidermis, or outside skin, hard and callous, has two sorts of wrinkles, some hollow, others prominent. In man, and other animals, the epidermis sticks every where close to the skin. In the elephant, it is only fastened by some points, like two quilted stuffs one above the other. This epidermis is naturally dry, and soon acquires three or four lines of thickness, by the crusts which are generated one above the other drying up. It is this thickness of the epidermis which produces the *elephantiasis*, or dry leprosy, to which man, whose skin is bare, like that of the elephant, is sometimes subject. This distemper is very common to elephants; and, to prevent it, the Indians take care to rub them often with oil, and to preserve the skin supple by frequent bathing. It is rather tender where it is not callous; and the elephant is so fearful of the sting of the flies, that he not only employs his natural motions, but even the resources of his intelligence, to get rid of them; he makes use of his tail, of his ears, of his trunk, to strike them; he contracts his skin wherever he can, and squeezes them to death betwixt his wrinkles. He cleans his skin by rubbing it with pumice stones, and afterwards pours on it perfumed oil and colours. The conformation of the feet and legs is also singular, and different in the elephant from that of other animals; the fore-legs seem to be higher than those behind, yet the hind-legs are the longest; they are not bent like the hind-legs of a horse, or an ox, the thighs of which seem to be of the same piece with the buttocks; their knee is very near the belly, and the foot so high, and so long, that it seems to make a great part of the leg. In the elephant, on the contrary, this part is very short, and touches the ground; he has the knee, like man, in the middle of the leg, not near the belly. This foot, so short and so small, is divided into five toes, which are all covered with a skin, none appearing outwardly; one sees only a sort of claws, the number of which varies, though that of the toes is constant; for he has always five to each foot, and commonly also five claws; but sometimes he has no more than four, or even three; and, in this case, they do not correspond exactly with the extremity of the fingers.

The ears of the elephant are very long; his tail is not longer than the ear; it is commonly near three feet in length; it is rather thin, sharp, and garnished at the extremity with a tuft of large, black shining, and solid bristles which are as large and as strong as wire; and a man cannot break them with his hands, as they are elastic and pliant. This tuft of hair is an ornament which the Negro women are particularly fond of; and they attribute to it some particular virtue, according to their superstitious notions; an elephant's tail is sometimes sold for two or three slaves; and the Negroes often hazard their lives to cut and snatch it from the living animal.

The largest elephants of the Indies, and the eastern coasts of Africa, are fourteen feet high; the smallest, which are found in Senegal, and in the other western parts of Africa, are not above ten or eleven feet; and those which have been brought young into Europe were not so high. That at the menagerie of Versailles, which came from Congo, was but seven feet and a half high in his seventeenth year. During thirteen years that he lived in France he did not grow above a foot; so that at the age of four, when he was sent, he was only six feet and a half high.

In order to give a complete idea of the nature and intelligence of this singular animal, we shall insert here some particulars communicated by the Marquis of Montmirail. The Indians make use of the elephant to carry artillery over mountains; and it is then that he gives the greatest proofs of his intelligence. He acts in the following manner:—When the oxen, yoked two and two, endeavour to draw up the mountain the piece of artillery, the elephant pushes the breech of the gun with his forehead; and at every effort that he makes, he supports the carriage with his knee, which he places near the wheel; and it seems as if he understands what is said to him. When his leader employs him in some hard labour, he explains what is his work, and the reasons which ought to engage him to obey. If the elephant shews an aversion to comply, the *cornca* (so his leader is called) promises to give him arrack, or something he likes; then the animal agrees to every thing proposed; but it is dangerous to forfeit his word: more than once *cornca* has been the victim of his deception. An instance of this happened in the Deckan, which deserves to be recorded; and, however incredible it may appear, it is exactly true. An elephant had been revenged of his *cornca* by killing him. His wife, witness of this catastrophe,

took her two children and threw them to the feet of the animal, still furious; telling him, *Since thou hast killed my husband, take also my life, and that of my children.* The elephant stopped short, grew calm, and, as if he had been moved with regret and compassion, took with his trunk the largest of the two children, placed it on his neck, adopted him for his cornac, and would have no other leader.

If the elephant is vindictive, he is no less grateful. A soldier of Pondicherry, who commonly carried to one of these animals a certain measure of arrack every time that he received his pay, having one day drank more than common, and seeing himself pursued by the guard, who threatened to conduct him to prison, took refuge under the elephant, and slept there. It was in vain that the guard attempted to draw him out from this asylum; the elephant defended him with his trunk. The next day the soldier became sober, was struck with terror to lie under an animal of this enormous bulk. The elephant, who, no doubt, perceived his consternation, caressed him with his trunk, to remove his fears, and made him understand that he might depart freely.

The elephant falls sometimes into a sort of a phrenzy, which deprives him of his tractableness, and makes him extremely formidable. He is commonly killed on the first symptoms of madness, for fear of mischief. Sometimes he is tied with heavy chains, in hopes that he will come to himself; but when he is in his natural state, the most acute pains cannot engage him to do any harm to persons who have not offended him. An elephant, furious with the wounds which he had received in battle at Hambour, ran through the fields, and cried out in a most hideous manner. A soldier, who, notwithstanding the warning of his companions, could not fly, perhaps, because he was wounded, remained in his way; the elephant was afraid to trample him under his feet, took him with his trunk, placed him gently on one side of the road, and continued his march. The gentlemen of the Academy of Sciences have also communicated to us some facts which they had learned from those who governed the elephant at the menagerie of Versailles; and these facts seem to deserve a place. "The elephant seemed to discern when any person made a fool of him; and he remembered the affront to be revenged of it the first opportunity. Having been baulked by a man, who feigned to throw something into his mouth, he struck him with his trunk, and broke two of his ribs; afterwards

he trampled him under his feet, and broke one of his legs; and having kneeled down, he tried to thrust his tusks into the man's belly, which, however, went into the ground on both sides of the thigh, which was not wounded. He bruised another man, by squeezing him against the wall, for a similar mockery. A painter was desirous to draw him in an extraordinary attitude, which was, to keep his trunk erect, and the mouth open. The servant of the painter, to make him remain in that attitude, threw fruit in his mouth; but afterwards he deceived him, which provoked his indignation; and, as if he had known that the cause of this deception was the painter's desire of having him drawn, he was revenged on the master, by throwing with his trunk a great quantity of water, which spoiled the paper intended for his design."

He made less use of his strength than of his dexterity, which was such, that he untied, with great facility, a double leather string which fastened his leg, with his mouth untying it from the buckle's tong, and after this buckle had a small string twisted around it, with divers knots, he untied them all, without breaking any thing. One night that he had thus disentangled himself from his leather strings, he broke open, so dexterously, the door of his lodge, that his governor was not waked by the noiser. He went thence into divers yards of the menagerie, breaking open the doors that were shut, and pulling down the stone-work, when the passage was too narrow for him; and thus he went into the lodges of other animals, terrifying them to such a degree, that they ran away to hide themselves in the remotest part of the park. In fine, to omit nothing of what may contribute to make all the natural faculties of this animal perfectly known, as well as his acquired knowledge, we shall add some facts, extracted from the most credible authors.

Of five elephants (says Tavernier), which hunters had taken, three escaped, although their bodies and their legs were fastened with chains and ropes. These men told us a very surprising circumstance, if we can believe it, which is, that when once these elephants have been caught, and eluded the snares of their adversaries, if they are compelled to go into the woods, they are mistrustful, and break with their trunk a large branch, with which they sound the ground before they put their foot upon it, to discover if there are any holes on their passage, not to be caught a second time; which made the hunters who related this sin-

gularity, despair of catching again the three elephants who had escaped. We saw the other two which they had caught; each of them was betwixt two tame elephants; and around the wild elephants were six men, holding spears. They spoke to these animals in presenting them something to eat, and telling them, in their language, *Take this, and eat it.* They had small bundles of hay. bits of black sugar, or rice boiled in water, with pepper. When the wild elephant refused to do what he was ordered, the men commanded the tame elephants to beat him, which they did immediately; one striking his forehead with his; and when he seemed to aim at revenge against his aggressor another struck him; so that the poor wild elephant perceived he had nothing to do but to obey.

I have observed several times (says Edward Terry) that the elephant does many things which are rather an indication of human reasoning, than a simple, natural instinct. He does whatever his master commands him. If he orders him to frighten any person, he advances towards him with the same fury as if he would tear him to pieces; and when he comes near him, he stops short, without doing him any harm. If the master wishes to affront another, he speaks to the elephant, who takes with his trunk dirty water, and throws it at his face. The Mogul has elephants for the execution of criminals condemned to death. If their leader bids them to dispatch these wretches soon, they tear them to pieces in a moment with their feet; on the contrary, if he commands them to make these criminals languish, they break their bones one after another, and make them suffer torments as cruel as those of the wheel.

THE RHINOCEROS.] After the elephant the rhinoceros is the most powerful of all quadrupeds. He is at least twelve feet in length, from the extremity of the snout to the tail; six or seven feet in height; and the circumference of his body is very near equal to his length; he is therefore like the elephant in bulk; and if he appears much smaller, it is because his legs are much shorter in proportion to those of the elephant; but he differs widely from that sagacious animal in his natural faculties and his intelligence, having received from Nature merely what she grants in common to all animals; deprived of all feeling in the skin, having no organ answering the purpose of hands, nor distinct for the sense of feeling, he has nothing instead

of a trunk, but a moveable lip, in which centers all his dexterity. He is superior to other animals only in strength, size, and the offensive weapon which he carries upon his nose, and which is peculiar to him. This weapon is a very hard horn, solid throughout, and placed more advantageously than the horns of ruminating animals; these only protect the superior parts of the head and neck, whilst the horn of the rhinoceros defends all the exterior parts of the snout, and preserves the muzzle, the mouth, and the face from insult; so that the tiger attacks more readily the elephant, in seizing his trunk, than the rhinoceros, which he cannot attack in front, without running the danger of being killed; for the body and limbs are covered with an impenetrable skin; and this animal fears neither the claws of the tiger nor the lion, nor even the fire and weapons of the huntsman; his skin is a dark leather, of the same colour, but thicker and harder than that of the elephant; he does not feel the sting of flies; he cannot contract his skin; it is only folded by large wrinkles on the neck, the shoulders, and the buttocks, to facilitate the motions of the legs, which are massive, and terminate in large feet, armed with three great claws. He has the head larger in proportion than the elephant; but the eye still smaller, which he never opens entirely. The upper jaw projects above the lower; and the upper lip has a motion, and may be lengthened six or seven inches; it is terminated by a sharp edge, which enables this animal, with more facility than other quadrupeds, to gather the grass, and divide it into handfuls, as the elephant does with his trunk. This muscular and flexible lip is a sort of trunk very incomplete, but which is equally calculated for strength and dexterity. Instead of those long ivory teeth which form the tusks of the elephant, the rhinoceros has his powerful horn, and two strong incisive teeth in each jaw. These incisive teeth, which the elephant has not, are placed at a great distance from each other in the jaws of the rhinoceros. He has, besides these, twenty-four smaller teeth, six on each side of each jaw. His ears are always erect; they are, for the form, like those of a hog, only they are larger in proportion to his body; they are the only hairy parts of it. The end of the tail is, like that of the elephant, furnished with a tuft of large bristles, very hard and very solid.

The rhinoceros which arrived in London in 1739 had been sent from Bengal. Although he was young (being but two years old) the expences of his food, and his voy-

age, amounted to near one thousand pounds sterling; he was fed with rice, sugar, and hay. They gave him daily seven pounds of rice, mixed with three pounds of sugar; which they divided into three parts. He had also a great quantity of hay and green grass, to which he gave the preference. His drink was nothing but water, of which he drank a great quantity at once. He was of a quiet disposition, and let his manager touch him on all the parts of his body. He grew unruly when he was struck, or was hungry; and in both cases he could not be appeased without giving him something to eat. When he was angry, he leaped forward with impetuosity to a great height, beating furiously the walls with his head, which he did with a prodigious quickness, notwithstanding his heavy appearance.

This rhinoceros, when he was two years old, was not much higher than a young cow who has not yet borne young; but his body was very long and very thick. The tongue of this young rhinoceros was soft, like that of a calf; his eyes had no vivacity; they are like those of a hog in form, and were placed very low; that is, nearer the opening of the nostrils.

Mr. Parsons says, that he has observed a very particular quality in this animal; he hearkened with a sort of continual attention to any noise; so that, if he was even sleepy, employed in eating, or in satisfying other urgent wants, he started instantly, raised up his head, and gave attention till the noise had ceased.

It is certain that some rhinoceroses have but one horn on the nose, and others two; it is not equally certain that this variety is constant, always depending on the climate of Africa, or the Indies. It seems, that the rhinoceroses who have but one horn, have it larger and longer than those who have two. There are single horns of three feet and a half, and perhaps of more than four feet in length, by six or seven inches in diameter at the basis; there are also double horns which are but two feet in length. Commonly, these horns are brown, or olive-colour; yet some are grey, and even white. They have only a small concavity, in form of a cup at their basis, by which they are fastened to the skin of the nose; the remaining part of the horn is solid, and very hard. It is with this weapon that the rhinoceros is said to attack, and sometimes to wound mortally, the largest elephants, whose long legs give to the rhinoceros, who has them much shorter, an opportunity



of striking them with his horn under the belly, where the skin is tender and more penetrable; but, when he misses the first blow, the elephant throws him on the ground and kills him.

The horn of the rhinoceros is more valued by the Indians than the ivory of the elephant; not so much on account of the matter, of which they make several works with the chisel, but for its substance to which they attribute divers virtues, and medicinal properties. The white ones, as the most rare, are also those which they value most.

The rhinoceros is, without being ferocious or carnivorous, or even very wild, nevertheless untameable. He is of the nature of a hog, blunt and grunting, without intellect, without sentiment, and without tractableness. These animals are also, like the hog, very much inclined to wallow in the mire; they like damp and marshy places, and seldom leave the banks of rivers. They are found in Asia and Africa, in Bengal, Siam, Saos, in the Mogul dominions, in Sumatra, in Java, in Abyssinia, in Ethiopia, and about the Cape of Good Hope. But, in general, the species is not so numerous, or so universally spread, as that of the elephant. The female brings forth but one young, and at a great distance of time. In the first month, the rhinoceros is not much bigger than a large dog, he has not, when first brought forth, the horn on the nose, although the rudiment of it is seen in the foetus. When he is two years old this horn is only an inch long; and in his sixth year it is about ten inches; and as some of these horns have been seen very near four feet long, it seems they grow till his middle age, and perhaps during the whole life of the animal, which must be long, since the rhinoceros described by Mr. Parsons was not come to half his growth when he was two years old; which makes it probable, that this animal lives, like a man, seventy or eighty years.

Without being useful, as the elephant, the rhinoceros is very hurtful by the prodigious devastation which he makes in the fields. The skin is the most valuable thing of this animal. His flesh is excellent, according to the taste of Indians and Negroes. Kolbe says, he has often eaten it with great pleasure. His skin makes the best and hardest leather in the world; and not only his horn, but all the other parts of his body, and even his blood, his urine, and his excrements, are esteemed as antidotes against poison, or a remedy

against several diseases; probably, however, all those virtues are imaginary.

The rhinoceros feeds upon herbs, thistles, prickles, shrubs, and he prefers this wild food to the sweet pasture of the verdant meadows; he is very fond of sugar-canes, and eats all sorts of corn. Having no taste whatever for flesh, he does not molest small animals, neither fears the large ones, living in peace with them all, even with the tiger, who often accompanies him, without daring to attack him. I doubt, therefore, whether the battles betwixt the elephant and the rhinoceros have any foundation; they must, however, seldom happen, since there is no notice for war on either side; and, besides, no sort of antipathy has been observed between these animals. Some have even been seen in captivity, living quietly together, without giving offence or provocation to each other.

The rhinoceroses do not herd together, nor march in troops, like the elephant; they are wilder, and more solitary, and perhaps more difficult to be hunted and subdued; they never attack men unless provoked; but then they become furious, and are very formidable, the steel of Damascus, the scymitars of Japan, cannot make an incision in his skin; the darts and lances cannot pierce him through: his skin even resists the balls of a musket; those of lead become flat upon his leather, and the iron ingots cannot penetrate through it: the only places absolutely penetrable in this body armed with a cuirass, are the belly, the eyes, and round the ears; so that huntsmen instead of attacking this animal standing, follow him at a distance by his track, and wait to approach him at the time that he sleeps or rests himself. There is in the King of France's cabinet a fœtus of a rhinoceros, which was sent from the island of Java, and extracted from the body of the mother. It was said, in a memorial which accompanied this present, that twenty-eight huntsmen had assembled to attack this rhinoceros; they had followed her far off for some days, one or two men walking now and then before, to reconnoitre the position of the animal. By these means they surprised her when she was asleep, and came so near in silence, that they discharged, all at once, their twenty-eight guns into the lower parts of her belly.

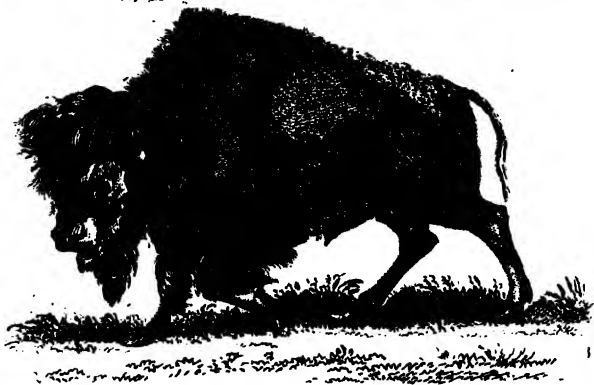
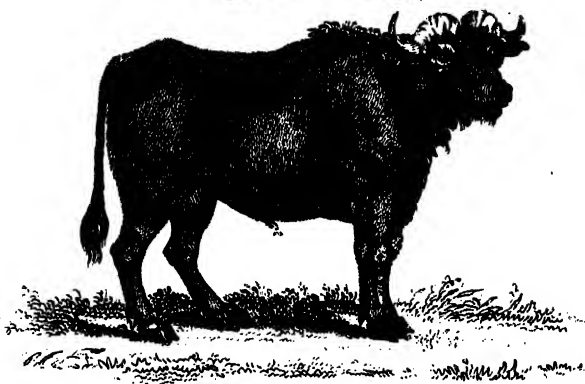
We have seen, that this animal has a good ear; it is also affirmed, that he has the sense of smelling in perfection; but it is pretended, he has not a good eye, and sees only before him: that his eyes are so small, and placed so low, and so

obliquely, they have so little vivacity and motion, that this fact needs no other confirmation. His voice, when he is calm, resembles the grunting of a hog; and when he is angry, his sharp cries are heard at a great distance. Though he lives upon vegetables, he does not ruminate; thus, it is probable, that, like the elephant, he has but one stomach, and very large bowels, which supply the office of the paunch. His consumption, though very great, is not comparable to that of the elephant; and it appears, by the thickness of his skin, that he loses less than the elephant by his perspiration.

THE CAMEL AND THE DROMEDARY. These two names do not include two different species, but only indicate two distinct breeds, subsisting from time immemorial, in the camel species. The principal, and, as may be said, the only perceptible character by which they differ, consists in the camel's bearing two bunches, or protuberances, and the dromedary only one. The latter is also much less, and not so strong as the camel; but both of them herd and copulate together; and the production from this cross breed is more vigorous, and of greater value than the others.

This mongrel issue from the dromedary and the camel forms a secondary breed, which also mix and multiply with the first; so that this species, as well as in that of other domestic animals, there are to be found a great variety, according to the difference of the climates they are produced in. Aristotle has judiciously marked the two principal breeds; the first (which has two bunches) under the name of the **BACTRIAN CAMEL**; and the second under that of the **ARABIAN CAMEL**; the first are called **TURKMAN**, and the others **ARABIAN CAMELS**. This division still subsists, with this difference only, that it appears, since the discovery of those parts of Africa and Asia which were unknown to the ancients, that the dromedary is without comparison, more numerous and more universal than the camel; the last being seldom to be found in any other place than in Turkey, and in some other parts of the Levant; while the dromedary, more common than any other beast of his size, is to be found in all the northern parts of Africa, in Egypt, in Persia, in South Tartary, and in all the northern parts of India.

The dromedary, therefore, occupies an immense tract of land, while the camel is confined to a small spot of ground;



the first inhabits hot and parched regions; the second a more moist and temperate soil. The camel appears to be a native of Arabia; for it is not only the country where there is the greatest number, but it is also best accommodated to their nature. Arabia is the driest country in the world; and the camel is the least thirsty of all animals, and can pass seven days without any drink. The land is almost in every part dry and sandy: the feet of the camel are formed to travel in sand; while, on the contrary, he cannot support himself in moist and slippery ground. Herbage and pasture are wanting to this country, as is the ox, whose place is supplied by the camel.

The Arabs regard the camel as a present from heaven, a sacred animal, without whose aid they could neither subsist, trade, nor travel. Its milk is their common nourishment; they likewise eat its flesh, especially that of the young ones, which they reckon very good. The hair of these animals, which is fine and soft, is renewed every year, and serves them to make stuffs for their clothing and their furniture. Blest with their camels, they not only want for nothing, but they even fear nothing. With them they can, in a single day, place a tract of desert, of fifty miles, between them and their enemies; and all the armies in the world would perish in the pursuit of a troop of Arabs. Let any one figure to himself a country without verdure, and without water, a burning sun, a sky always clear, plains covered with sand, and mountains still more parched, over which the eye extends, and the sight is lost, without being stopped by a single living object; a dead earth, *flayed* (if I may be allowed the expression) by the winds, which presents nothing but bones of dead bodies, flints scattered here and there, rocks standing upright or overthrown; a desert entirely naked, where the traveller never drew his breath under the friendly shade; where he has nothing to accompany him, and where nothing reminds him of living nature; an absolute void a thousand times more frightful than that of the forest, whose verdure, in some measure, diminishes the horrors of solitude; an immensity which he in vain attempts to over-run; for hunger, thirst, and burning heat, press on him every weary moment that remains between despair and death.

Nevertheless, the Arab has found means to surmount these difficulties, and even to appropriate to himself these gaps of Nature: they serve him for an asylum; they secure his repose, and maintain him in his independence. But

why does not man know how to make use of them without abuse? This same Arab, free, independent, tranquil, and even rich, instead of respecting those deserts as the ramparts of his liberty, foils them with guilt: he traverses over them to the neighbouring nations, and robs them of their slaves and gold: he makes use of them to exercise his robberies, which, unfortunately he enjoys more than his liberty; for his enterprizes are almost always successful: notwithstanding the caution of his neighbours, and the superiority of their forces, he escapes their pursuit, and, unpunished, bears away all that he has plundered them of.

An Arab who destines himself to this business of land piracy, early hardens himself to the fatigue of travelling: he accustoms himself to pass many days without sleep; to suffer hunger, thirst, and heat; at the same time, he instructs his camels, he brings them up, and exercises them in the same method. A few days after they are born he bends their legs under their bodies, and constrains them to remain on the earth, and loads them, in this situation, with a weight as heavy as they usually carry, which he only relieves them from to give them a heavier. Instead of suffering them to feed every hour, and drink even when they are thirsty, he regulates their repasts, and, by degrees, increases them to greater distances between each meal, diminishing also, at the same time, the quantity of their food. When they are a little stronger, he exercises them to the course; he excites them by the example of horses, and endeavours to render them also as swift, and more robust; at length, when he is assured of the strength and swiftness of his camels, and that they can endure hunger and thirst, he then loads them with whatever is necessary for his and their subsistence. He departs with them, arrives unexpectedly at the borders of the deserts, stops the first passenger he sees, pillages the straggling habitations, and loads his camels with his booty. If he is pursued he is obliged to expedite his retreat; and then he displays all his own and his animals' talents. Mounted on one of his swiftest camels, he conducts the troop, makes them travel day and night, almost without stopping either to eat or drink. In this manner he easily passes over three hundred miles in eight days; and, during all that time of fatigue and travel, he never unloads his camels, and only allows them an hour of repose, and a ball of paste each day. They often run in this manner for eight or nine days without meeting with any water, during which

time they never drink; and when by chance they find a *وادي* at some distance from their route, they smell the water at more than half a mile before they come to it. Thirst now makes them redouble their pace; and then they drink enough for all the time past, and for as long to come; for often they are many weeks in travelling, and their time of abstinence endures as long as they are upon their journey.

In Turkey, Persia, Egypt, Arabia, Barbary, &c. they use no other carriage for their merchandize than camels, which is, of all their conveyances, the most ready and the cheapest. Merchants, and other travellers, assemble themselves in caravans to avoid the insults and piracies of the Arabs. These caravans are often very numerous and often composed of more camels than men. Every one of these camels is loaded according to his strength; and he is so sensible of it himself, that when a heavier load than usual is put upon him he refuses it, by constantly remaining in his resting posture till he is lightened of some of his burden.

Large and strong camels generally carry 1000, and even 1200 weight; the smaller only six or 700. In these commercial journeys they do not travel quick; and, as the route is often seven or eight hundred miles, they regulate their stages; they only walk, and go every day ten or twelve miles; they are disburthened every evening, and are suffered to feed at liberty. If they are in a part of the country where there is pasture, they eat enough in one hour to serve them twenty-four, and to ruminate on during the whole night; but they seldom meet with pastures, and this delicate food is not necessary for them: they even seem to prefer wormwood, thistles, nettles, furze, and other thorny vegetables, to the milder herbs; and so long as they can find plants to browse on they very easily live without any drink.

This facility with which they abstain so long from drinking is not pure habit, but rather an effect of their formation. Independent of the four stomachs which are commonly found in ruminating animals, the camel is possessed of a fifth bag, which serves him as a reservoir to retain the water. This fifth stomach is peculiar to the camel. It is of so vast a capacity as to contain a great quantity of liquor, where it remains without corruption, or without the other aliments being able to mix with it. When the animal is pressed with thirst, or has occasion to dilute

the dry food, and to macerate it for rumination, he causes a part of this water to re-ascend into the stomach, and even to the throat, by a simple contraction of the muscles.

This animal bears about him all the marks of slavery and pain; below the breast, upon the sternum, is a thick and large callosity, as tough as horn; the like substance appears upon the joints of the legs; and though these callosities are to be met with in every animal, yet they plainly prove that they are not natural, but produced by an excessive constraint and pain, as appears from their being often found filled with pus. It is therefore evident, that this deformity proceeds from the custom to which these animals are constrained, of forcing them, when quite young, to lie upon their stomach with their legs bent under them, and in that cramped posture to bear not only the weight of their body, but also the burdens with which they are laden. These poor animals must suffer a great deal, as they make lamentable cries, especially when they are over-loaded; and, notwithstanding they are continually abused, they have as much spirit as docility. At the first sign they bend their legs under their bodies, and kneeling upon the ground they are unloaded, without the trouble of lifting up the load to a great height, which must happen were they to stand upright. As soon as they are loaded, they raise themselves up again without any assistance or support; and the conductor, mounted on one of them, precedes the whole troop, who follow in the same pace as he leads. They have neither need of whip or spur to excite them; but, when they begin to be fatigued, their conductors support their spirits, or rather charm their weariness, by a song, or the sound of some instrument. When they want to prolong the route, or double the day's journey, they give them an hour's rest; after which, renewing their song, they again proceed on their way for many hours more; and the singing continues until the time that they stop. Then the camels again kneel down on the earth, to be relieved from the burden, by the cords being untied, and the bales rolled down on each side. They remain in this cramped posture, with their belly couched upon the earth, and sleep in the midst of their baggage, which is tied on again the next morning with as much readiness and facility as it was untied before they went to rest. These are, however, not their only inconveniences: they are prepared for all these evils by one still greater; by mutilating them by castration while young. They leave but one male for eight or ten females; and all

the labouring camels are commonly gelt: they are weaker, without doubt, than those which are not castrated; but they are more tractable than the others, who are not only indocile, but almost furious, in the rutting time, which remains forty days, and which happens every spring of the year. The female goes with young exactly a year, and like all other large animals, produces but one at a birth. They have great plenty of milk, which is thick, and nourishing even for the human species, if it is mixed with a more than equal quantity of water. The females seldom do any labour while they are with young, but are suffered to bring forth at liberty. The profit which arises from their produce, and from their milk, perhaps, surpasses that which is got from their labour; nevertheless, in some places, a great part of the females undergo castration, as well as the males, in order to render them more fit for labour. In general, the fatter the camels are, the more capable they are of enduring great fatigues. Their hunches appear to be formed only from the superabundance of nourishment; for, in long journeys, where they are obliged to stint them in their food, and where they suffer both hunger and thirst, these hunches gradually diminish, and are reduced almost even; and the eminences are only discovered by the height of the hair, which is always much longer upon these parts than upon any other part of the back.

The young camel sucks its mother a year: and when they want to bring him up so as to make him strong and robust, they leave him at liberty to suck or graze for a longer time, nor begin to load him, or put him to labour, till he has attained the age of four years. The camel commonly lives forty or fifty years.

The camel is not only of greater value than the elephant, but perhaps not of less than the horse, the ass, and the ox, all united together. He alone carries as much as two mules; he not only also eats less, but likewise feeds on herbs as coarse as the ass. The female furnishing milk a longer time than the cow; the flesh of young camels is good and wholesome, like veal; their hair is finer, and more sought after than the finest wool; there is not a part of them even to their excrements, from which some profit is not drawn, for sal ammoniack is made from their urine; their dung, when dried and powdered, serves them for litter, as it does for horses, with whom they often travel into countries, where neither straw nor hay is known. In fine, a kind of

turf is also made of this dung, which burns freely, and gives a flame as clear, and almost as lively, as that of dry wood; even this is another great use, especially in desarts, where not a tree is to be seen, and where, from the deficiency of combustible matters, fire is almost as scarce as water.

THE BUFFALO, THE AUROCHS, THE BISON, AND THE ZEBU. Although the Buffalo is, at this present time, common in Greece, and tame in Italy, it was neither known by the Greeks nor Romans; for it never had a name in the language of these people. The word *buffalo* even indicates a strange origin, not to be derived either from the Greek or Latin tongues. In effect, this animal is originally a native of the hottest countries of Africa and India, and was not transported and naturalized in Italy till towards the seventh century. It is true, the ancients have spoken of an animal, as of different species from the ox, under the name of *bubalus*; and Aristotle has mentioned the wild ox of Pæonia, which he has called *bonasus*. Both the ancients and moderns, however, have multiplied the species unnecessarily; and from attentive observation I am clearly of opinion, that there are but two species which are essentially different, viz. the ox and the buffalo.

We may observe, throughout the different regions of the world, the breed of oxen differing from each other in all external appearances, according to the nature of the climate, or other circumstances; but the most remarkable difference is that which divides them into two classes, viz. the *aurochs*, or ox without a hunch on its back, and the *bison*, or hunched ox. From indubitable facts, however, we have the utmost reason to conclude, that these are no other than varieties of the same species. The hunch, the length and quality of the hair, and the form of the horns, are the sole characters by which the bison is distinguished from the aurochs; but the hunched oxen copulate and produce with our oxen; and we likewise know, that the length and quality of the hair, in all animals, depends on the nature of the climate; and we have remarked, that in oxen, goats, and sheep, the form of the horns is various and fluctuating. These differences, therefore, do not suffice to establish two distinct species; and since our tame ox of Europe copulates with the hunched ox of India, we have the greatest reason to think that it would also copulate with the bison, or hunched ox of Europe. Notwithstanding this, however, we are not

to be surprised, that the two kinds have not melted or coalesced into a mongrel breed, since many circumstances may have occurred to keep them asunder; and, in fact, we actually find that these kinds have subsisted till this present time, either in a free and wild, or in a tame state; and are scattered, or rather have been transported, into all the climates of the earth. All the tame oxen without hunches have proceeded from the aurochs, and all with hunches are issues of the bison. In order to give a just idea of the varieties, we shall make a short enumeration of these animals, such as they are found actually to be in the different parts of the earth.

To begin with the north of Europe, the few oxen and cows which subsist in Iceland are without horns, although they are of the same kind as our oxen. The size of these animals is rather relative to the plenty and quality of pasture, than to the nature of the climate. The Dutch have often brought lean cows from Denmark, which fatten prodigiously in their meadows, and which give plenty of milk. These Danish cows are longer than ours. The oxen and cows of Ukraïn, where there is excellent pasture, are said to be the largest in Europe; they are also of the same kind as our oxen.

The breed of aurochs, or ox without a hunch, inhabits the cold and temperate zones. It is not very much dispersed towards the southern countries: on the contrary, the breed of the bison, or hunched ox, fills all the southern provinces at this present time. In the whole continent of India; the Islands of the South Seas; in all Africa, from Mount Atlas to the Cape of Good Hope, we find, I may say, nothing but hunched oxen; and it even appears, that this breed, which has prevailed in all the hot countries, has many advantages over the others. These hunched oxen, like the bison, of which they are the issue, have the hair much softer, and more glossy than our oxen, who, like the aurochs, are furnished but with little hair, which is of a harsh nature. These hunched oxen are also swifter, and more proper to supply the place of a horse; at the same time, that they have a less brutal nature, and are not so clumsy and stupid as our oxen; they are more tractable, and sensible which way you would lead them. The regard the Indians have for these animals is so great as to have almost degenerated into superstition. The ox, as the most useful animal, has appeared to them the most worthy of being revered; for this purpose, they have made an idol of

the object of their veneration, a kind of beneficent and powerful divinity; for we are desirous of rendering all we respect great, and capable of doing much good, or much harm.

These hunched oxen, perhaps, vary again more than ours in the colours of the hair, and the figure of the horns. The handsomest are all white, like the oxen of Lombardy; there are also some that are without horns; there are others who have them very much elevated, and others so bent down, that they are almost pendant; it even appears, that we must divide this first kind of Bisons, or hunched oxen, into two secondary kinds; the one very large, and the other very small; and this last is that of the ZEBU; both of them are found nearly in the same climates, and both are equally mild and easy to drive; both have soft hair, and a hunch on the back. This hunch does not depend on the conformation of the spine, nor on the bones of the shoulder; it is nothing but an excrescence, a kind of wen, a piece of tender flesh, as good to eat as the tongue of an ox. The wens of some oxen weigh about forty or fifty pounds; others have them much smaller; some of these oxen have also prodigious horns for their size; there is one in the French king's cabinet, which is three feet and a half in length, and seven inches in diameter at the base. Many travellers affirm, they have seen them of a capacity sufficient to contain fifteen, and even twenty pints of water.

Thus all the southern parts of Africa and Asia are inhabited with hunched oxen, or bisons, among which a great variety is to be met with in respect to size, colour, shape of the horns, &c. On the contrary, all the northern countries of these two parts of the world, and Europe entire'y, comprehending even the adjacent islands, to the Azores, are only inhabited by oxen without a hunch, who derive their origin from the aurochs. The bison, or wild hunched ox, is stronger, and much larger than the tame ox of India; it is also sometimes smaller; but that depends only on the quantity of food. At Malabar, at Abyssinia, at Madagascar, where the meadows are naturally spacious and fertile, the bisons are all of prodigious size. In Africa and Arabia Petræa, where the land is dry, the zebus, or bisons, are of the smallest stature.

Every part of South America is inhabited by oxen without hunches, which the Spaniards, and other Europeans, have successfully transported. These oxen are multiplied, and are only become smaller in these countries. In all

he northern parts, as far as Florida, Louisiana, and even as far as Mexico, the bisons, or hunched oxen, are to be found in great numbers. These bisons, which formerly inhabited the woods of Germany, Scotland, and other of our northern countries, have probably passed from one continent to the other, and are become, like other animals, smaller in this new world; and as they are habituated to climates more or less cold, they have preserved their coat more or less warm; their hair is longer and thicker; the beard is longer at Hudson's Bay than at Mexico; and, in general, this hair is softer than the finest wool.

Thus the wild and the tame ox, the European, the Asian, the American, and the African ox, the bonasus, the aurochs, the bison, and the zebu, are all animals of one and the same species, who, according to the climates, food, and different usage they have met with, have undergone all the variations we have before explained. The ox, as the most useful animal, is also the most universally dispersed. He appears ancient in every climate, tame among civilized nations, and wild in deserts or unpolished countries; he supports himself by his own strength when in a state of nature, and has never lost the qualities which are useful to the service of man. The young wild calves which are taken from their mothers in India and Africa have, in a short time, become as tractable as those which are the issue of the tame kind; and this natural conformity is another striking proof of the identity of the species.

If it be asked, which of the two kinds, the aurochs or the bison, claims the first place? It appears to me, that a satisfactory answer may be drawn from the facts we have just laid down. The hunch or wen of the bison is probably no other than an accidental character, which is defaced and lost in the mixture of the two kinds. The auroch, or ox without an hunch then, is the most powerful and predominant of the two; for, if it was the contrary, the hunch, instead of disappearing, would extend and remain upon every one of this mixed breed. What confirms and proves still more the identity of the species of bison and aurochs is, that the bisons, or hunch-backed oxen, in the north of America, have so strong a smell, that they have been called *musk oxen* by the greatest number of travellers; and, at the same time, we find, by the accounts of observing people, that the aurochs, or wild ox of Prussia and Livonia, has the smell of musk, like the bison of America.

There remain, therefore, but two species, the **BUFFALO** and the **Ox**, out of all the names placed at the head of this section; to each of which the ancient and modern naturalists have given a separate and distinct species. These two animals, although greatly resembling each other, both tame, and often living under the same roof, and fed in the same meadows, yet, when brought together, and even excited by their keepers, have ever refused to unite and copulate together; their nature is more distant than that of the ass is from the horse; there even appears to be a strong antipathy between them; for it is affirmed, that cows will not suckle the young buffaloes; and the female buffalo refuses the same kindness to the other's calves. The buffalo is of a more obstinate nature, and less tractable than the ox; he obeys with great reluctance, and his temper is more coarse and brutal; like the hog, he is one of the filthiest of the tame animals, as he shews by his unwillingness to be cleansed and dressed; his figure is very clumsy and forbidding; his looks stupidly wild; he carries his tail in an ignoble manner, and his head in a very bad posture, almost always inclined towards the ground; his voice is a hideous bellowing, with a tone much stronger, and more hoarse than that of the bull; his legs are thin, his tail bare, and his physiognomy dark, like his hair and skin. He differs externally from the ox, chiefly in the colour of his hide; and this is easily perceived under the hair, with which he is but sparingly furnished; his body is likewise thicker and shorter than that of the ox; his legs are longer and proportionably much less; the horns not so round, black, and partly compressed, with a tuft of hair frizzled over his forehead; his hide is likewise thicker and harder than that of the ox; his flesh is black and hard, and not only disagreeable to the taste, but to the smell; the milk of the female is not so good as that of the cow; nevertheless, she yields a greater quantity. In hot countries almost all the cheese is made of buffaloes milk. The flesh of the young buffaloes, though killed during the suckling time, is not good. The hide alone is of more value than all the rest of the beast, whose tongue is the only part that is fit to eat. This hide is firm, light, and almost impenetrable. As these animals, in general, are larger and stronger than the oxen, they are very serviceable in the plough; they draw well, but do not carry burdens; they are led by the means of a ring passed through their nose. Two buffaloes harnessed, or rather chained to a waggon, will draw as

much as four strong horses. As they carry their tails and their heads naturally downwards, they employ the whole force of their body in drawing; and this heavy mass greatly surpasses that of a horse, or a labouring ox.

The form and thickness of the buffalo alone are sufficient to indicate that he is a native of the hottest countries. The largest quadrupeds belong to the torrid zone in the Old Continent; and the buffalo, for his size and thickness, ought to be classed with the elephant, the rhinoceros, and the hippopotamus. The camel is more elevated, but slenderer, and is also an inhabitant of the southern countries of Africa and Asia: nevertheless, the buffaloes live and multiply in Italy, in France, and in other temperate provinces. Those that are in the French king's menagerie have brought forth two or three times. The female has but one at a time, and goes about twelve months; which is another proof of the difference between this species and that of the cow, who only goes nine months. It appears also, that these animals are gentler and less brutal in their native country; and the hotter the climate is the more tractable is their nature. In Egypt they are more so than in Italy; and in India they are more so than in Egypt. Those of Italy have also more hair than those of Egypt, and those of Egypt more than those of India. Their coat is never entirely covered, because they are natives of hot countries; and, in general, large animals of this climate have either no hair, or else very little.

There are a great number of wild buffaloes in the countries of Africa and India, which are watered with many rivers, and furnished with large meadows. These wild buffaloes go in droves, and make a great havock in cultivated lands; but they never attack the human species, and will not run at them, unless they are wounded, when they are very dangerous; for they make directly at their enemy, throw him down, and trample him to death under their feet; nevertheless, they are greatly terrified at the sight of fire, and are displeased at a red colour.

The buffalo, like all other animals of southern climates, is fond of bathing, and even of remaining in the water; he swims very well, and boldly traverses the most rapid floods. As his legs are longer than those of the ox, he runs also quicker upon land. The Negroes in Guinea, and the Indians in Malabar, where the wild buffaloes are very numerous, often hunt them. They neither pursue them nor attack them openly, but, climbing up the trees, or hiding

themselves in the woods, they wait for them, and kill them, the buffaloes not being able, without much trouble to penetrate these forests, on account of the thickness of their bodies, and the impediment of their horns, which are apt to entangle in the branches of the trees. These people are fond of the flesh of the buffalo, and gain great profit by vending their hides and their horns, which are harder and better than those of the ox. The animal that is called in Congo *empucapa*, or *pacapa*, though very ill described by travellers, seems to me to be the buffalo; as that which they have spoken of, under the name of *empubunga*, or *impaiunca*, in the same country, may possibly be the bubalus.

CHAP. XVII.

Of the Mufflon, and other Sheep—The Axis—The Tapir—The Zebra—The Hippopotamus—The Elk, and Rein Deer.

THE MUFFLON, AND OTHER SHEEP.

THE breed of sheep, though perhaps originally all of the same species, yet are found to be very different in different countries. Our domestic sheep is only to be met with in Europe, and some of the most temperate provinces in Asia, and if transported into Guinea loses its wool, and is covered with hair. It increases there but little, and its flesh has no longer the same taste: it cannot also subsist in cold countries; but even in those, and in Iceland, a breed of sheep is to be found, who have many horns, short tails, harsh and thick wool, under which, as in almost every animal in the north, is a second lining, of a softer, finer, and thicker wool. In warm climates, some are covered with wool, others with hair, and a third kind with hair mixed with wool. The first kind of sheep of those countries is that commonly called the Barbary or Arabian sheep, which entirely resembles the tame kind, excepting in the tail, which is very much loaded with fat, is often more than a foot broad, and weighs upwards of twenty pounds. As for external appearance, this sheep has nothing remarkable, but the tail, which he carries as if a pillow was fastened to his hinder parts. Among this kind

of broad-tailed sheep, there are some whose tails are so long and heavy, that the shepherds are obliged to fasten a small board with wheels, in order to support them as they walk along. In the Levant, these sheep are clothed with a very fine wool. In the hotter countries, as Madagascar, and East India, they are clothed with hair. The superabundance of fat, which in our sheep fixes upon the reins, in these sheep descends under the vertebræ of the tail; the other parts of the body are less charged with it than in our fat sheep. This variety is to be attributed to the climate, the food, and the care of mankind; for these broad, or long-tailed sheep, are tame, like those of our country; and they even demand much more care and management. This breed is much more dispersed than ours; they are commonly met with in Turkey, Persia, Syria, Egypt, Barbary, Ethiopia, and Madagascar; and even as far as the Cape of Good Hope.

In the island of the Archipelago, and chiefly in the island of Candia, there is a breed of sheep of which Bellon has given the figure and description, under the name of *strepsichoros*. This sheep is of the make of our common sheep: it is, like that, clothed with wool, and only differs from it by the horns, which are straight, and in spiral furrows.

In short, in the hottest countries of Africa and India, there is a breed of large sheep, which has rough hair, short horns, hanging ears, and a kind of tuft under the tail; Leo Africanus, and Marmol, call it *adamain*; and it is known to the naturalists by the names of the *Senegal ram*, the *Guinea ram*, and the *Angola sheep*, &c. He is tame like ours, and, like him, subject to variety. These, though different in themselves by particular characters, resemble each other so much in other respects, that we can scarcely doubt but they are of the same kind.

In considering, therefore, according to the difference of climate, the sheep which are purely tame, we find,

1. The sheep of the north, who have many horns, and whose wool is rough and very thick; and the sheep of the island of Gothland, Muscovy, and many other parts of the north of Europe, whose wool is thick, and who appear to be of the same breed.

2. Our sheep, whose wool is very good and fine in the mild climates of Spain and Persia, but in hot countries changes to a rough hair. We have already observed, this conformity in this influence of the climates of Spain and

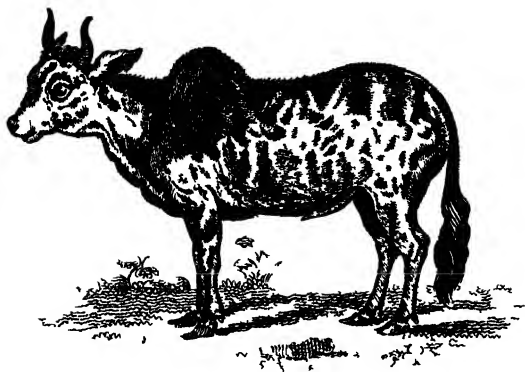
Chorasan, a province of Persia, on the hair of cats, rabbits, hares, &c. it acts in the same manner upon the wool of sheep, which is very fine in Spain, and still finer in this part of Persia.

3. The broad-tailed sheep, whose wool is also very fine in temperate countries, such as Persia, Syria, and Egypt; but which, in hot countries, changes into a hair more or less rough.

4. The sheep *strepsichoros*, or Cretan sheep, who resemble ours both in wool and make, excepting the horns, which are straight and furrowed.

6. The *adimain*, or the great sheep of Senegal and India, which in no part is covered with wool, but on the contrary, is clothed with hair, which is longer or shorter, rougher or smoother, according to the heat of the climate. All these sheep are only varieties of one and the same species, and certainly would copulate one with the other, since the goat, whose species is farther distant, copulates with our sheep, as we are assured from experience. But none of these tame sheep have the characters of an original species. In the mountains of Greece, in the islands of Cyprus, Sardinia, Corsica, and the deserts of Tartary, the animal which we call the *mufflon*, is still to be found. It appears to us, to be the primitive stock of all sheep. He lives in a state of nature, and subsists and multiplies without the help of man; he resembles the several kinds of tame sheep, more than any other animal; he is livelier, stronger, and swifter than they are; his head, forehead, eyes, and face, are like the ram's; he resembles him also in the form of the horns, and in the whole habit of body. In short he copulates with the tame sheep which alone is sufficient to demonstrate, that he is of the same species, and the primitive stock of the different breeds.

The only disagreement betwixt the *mufflon* and our sheep is, that the first is covered with hair instead of wool; but we have observed that, even in a tame sheep, the wool is not an essential character, but a production of a temperate climate. Hence, it is not astonishing that the original, or primitive and wild sheep, who has endured cold and heat, lived and increased, without shelter, in the woods, is not covered with wool, which he would soon be deprived of among the thickets and thorny bushes. Besides, when a he-goat is coupled with a tame sheep, the production is a kind of wild *mufflon*, a lamb covered with hair, and not a barren mule, but a mungrel, which returns to the original



1



3

1. Cebu — 2. Ireland Ram — 3. Maltese Ram.

species, and which appears to indicate that our goats, and tame sheep, have something common to them both in their origin.

The horns of a WALLACHIAN RAM and SHEEP are remarkably different from those of our sheep; but it is not certain whether this species be common in Wallachia, whether these are to be accounted only varieties.

THE AXIS. This animal being only known by the vague names of the *hind* of *Sardinia*, and the *deer* of the *Ganges*, we have thought it necessary to preserve the name which Bellon has given to him, and which he borrowed from Pliny. The axis is of the small number of ruminating animals who wear horns, like the stag. He has the shape and swiftness of the fallow-deer; but what distinguishes him from the stag and fallow-deer is, that his body is marked with white spots, elegantly disposed, and separated one from another, and that he is a native of hot countries; while the stag and deer have their coat of an uniform colour, and are to be met with in greater numbers in cold countries and temperate regions, than in hot climates.

The gentlemen of the Academy of Sciences have only given him the name of the *Sardinian hind*, because, very probably, they received that name from the royal menagerie; but there is nothing indicated of this animal's being a native of Sardinia; no author has ever mentioned, that he exists in this island like a wild animal; but on the contrary we see, by examining authors, that he is found in the hottest countries of Asia.

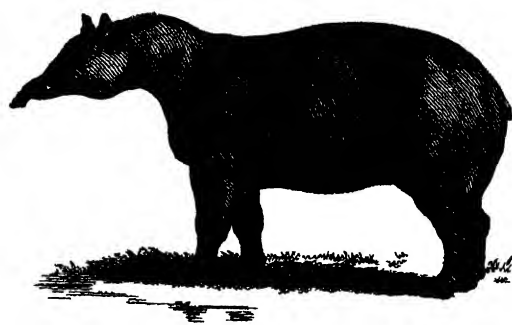
We have only remarked, that there is no species which approach so near to another as that of the deer to the stag; nevertheless, the axis appears to be an intermediate mixture between the two. He resembles the deer in the size of his body, the length of his tail, and his coat, which is the same during his whole life: he only essentially differs from that animal in his horns, which nearly resemble those of the stag. The axis, therefore, may possibly be only a variety depending on the climate, and not a different species from the deer; for, although he is a native of the hottest countries of Asia, he supports, and easily multiplies in, that of Europe. There are many herds of them in the menagerie of Versailles: but it has never yet been observed, that they mix either with the

deer or with the stags ; and this is the cause of our presuming, that it was not a variety of one or the other, but a particular and mediate species between the two.

THE TAPIR, or the ANTA, is the largest animal in America, where living nature seems to be lessened, or rather has not had time to arrive at its greatest dimensions. The animals also of South America, which alone properly and originally belong to this New Continent, are almost all without defence, without horns, and without tails ; their bodies and their limbs are unproportioned ; and some, as the sluggish and crawling animals, &c. are of so miserable a nature that they scarcely have the faculties of moving or of eating ; they drag on a languishing life, in the solitude of a desert, and cannot subsist in the inhabited world, where man and powerful animals would have soon destroyed them.

The tapir is of the size of a small cow, or zebu, but without horns, and without a tail ; the legs are short ; the body crooked, like that of the hog ; wearing, in his youth, a coat like that of the stag, and afterwards, uniform spots, of a dark brown colour ; his head is thick and long, with a kind of trunk, like the rhinoceros ; he has ten incisive teeth, and ten grinders, in each jaw ; a character which separates him entirely from the ox, and other ruminating animals.

The tapir appears to be a dull and dark animal, who never stirs out but in the night, and delights in the water, where he oftener lives than upon land. He is chiefly to be found in marshes, and seldom goes far from the borders of rivers or lakes. When he is threatened, pursued, or wounded, he plunges into the water, and remains there till he has got to a great distance before he re-appears. These customs, which he has in common with the hippopotamus, have made some naturalists imagine him to be of the same species ; but he differs as much from him in nature, as he is distant from him in climate. To be assured of this, there needs no more than to compare the description we have now recited with that of the hippopotamus. Although the tapir inhabits the water, he does not feed upon fish ; and, although his mouth is armed with twenty sharp and incisive teeth, he is not carnivorous : he lives upon plants and roots, and does not make use of what Nature has armed him with against other animals. His is of a mild

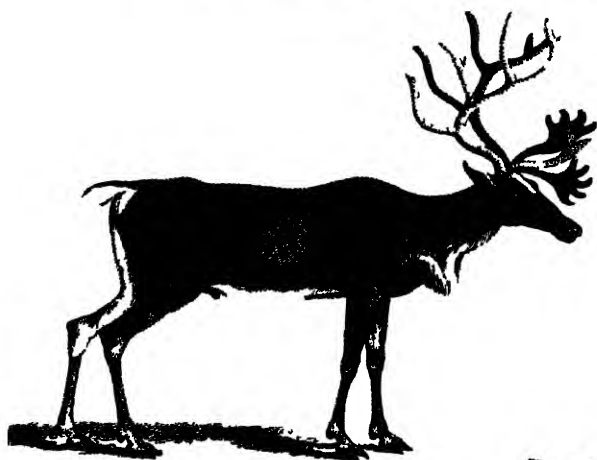
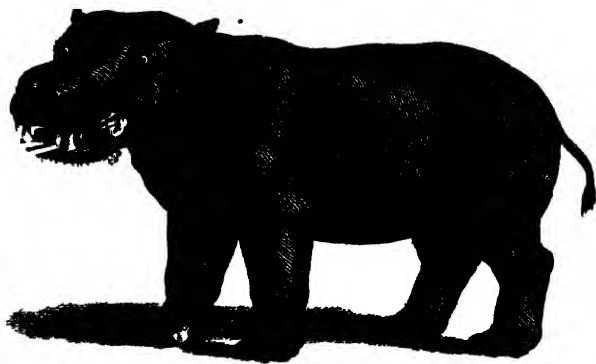


1. *Cervus* 2. *Tapir* 3. *Zebra*

colour, with a flaxen cross. The zebra is also of a different climate from the onagra, and is only to be met with in the most eastern and the most southern parts of Africa, from Ethiopia to the Cape of Good Hope, and thence to Congo; it exists neither in Europe, Asia, nor America, nor even in all the northern parts of Africa: those which some travellers tell us they have seen at the Brazils, have been transported thither from Africa; those which others are recounted to have seen in Persia, and in Turkey, have been brought from Ethiopia; and, in short, those that we have seen in Europe are almost all from the Cape of Good Hope. This point of Africa is their true climate, their native country, and where the Dutch have employed all their care to subject them, and to render them tame, without having been hitherto able to succeed. That which we have seen, and which has served for the subject of our description, was very wild when he arrived at the royal menagerie in France; and he was never entirely tamed; nevertheless, he has been broken for the saddle; but there are precautions necessary: two men held the bridle, while a third was upon him. His mouth is very hard; his ears so sensible, that he winces whenever any person goes to touch them. He was restive, like a vicious horse, and obstinate as a mule; but perhaps the wild horse, and the onagra, are not less intractable; and there is reason to believe, that if the zebra was accustomed to obedience and tameness, from his earliest years, he would become as mild as the ass and the horse, and might be substituted in their room.

THE HIPPOPOTAMUS. Although this animal has been celebrated from the earliest ages, it was, notwithstanding, but imperfectly known to the ancients. It was only towards the sixteenth century that we had some precise indications on the subject.

In comparing the descriptions which we have observed in different travellers, the hippopotamus appears to be an animal whose body is longer and thicker than that of the rhinoceros; but his fore legs are much shorter. His head is short, and thick in proportion to the body. He has no horns, neither on the nose, like the rhinoceros, nor on the head, like ruminating animals. His cry, when hurt, approaches as near to the neighing of the horse as the bellowing of the buffalo; but his usual voice resembles the neighing of a horse, from which, however, he differs in



1. *Hippopotamus* . 2. *Rein^d Deer* . 3. *Elk*

every other respect ; and this fact, we may presume, has been the sole reason for giving him the name of *hippopotamus*, or *river-horse* ; as the howling of the lynx, which resembles that of the wolf, has occasioned him to be called the *stag-like wolf*. The incisive teeth of the hippopotamus, and especially the two canine teeth of the lower jaw, are very long, very strong, and of so hard a substance, that they strike fire with a piece of iron. This is probably what has given rise to the fable of the ancients, who have reported that the hippopotamus vomited fire. These canine teeth of this animal are of white, so clean and so hard, that they are preferable to ivory for making artificial teeth. The incisive teeth of the hippopotamus, especially those of the lower jaw, are very long, cylindrical, and furrowed. The canine teeth, which are also very long, are crooked, prismatic and sharp, like the tusks of a boar. The molars are square, or rather longer on one side than the other, nearly like the grinders of a man, and so thick that a single one weighs more than three pounds. The largest of the incisive, or the canine teeth, are twelve and even sixteen inches in length, and sometimes weigh twelve or thirteen pounds each.

The male hippopotamus is about six feet nine inches long from the extremity of the muzzle to the beginning of the tail ; fifteen feet in circumference, and six feet and a half in height. His legs are about two feet ten inches long ; the length of the head three feet and a half, and eight feet and a half in circumference ; and the width of the mouth two feet four inches.

Thus powerfully armed, with a prodigious strength of body, he might render himself formidable to every animal ; but he is naturally gentle, and is otherwise so heavy and slow, that he cannot possibly catch any other quadruped in the chace. He swims quicker than he runs, pursues the fish, and makes them his prey. He delights much in the water, and stays there as willingly as upon land ; notwithstanding which he has no membranes between his toes, like the beaver and otter ; and it is plain, that the great ease with which he swims is only owing to the great capacity of his body, which only makes bulk for bulk, and is nearly of an equal weight with the water. Besides, he remains a long time under water, and walks at the bottom as well as he does in the open air. When he quits it to graze upon land he eats sugar-canes, rushes, millet, rice, roots, &c. of which he consumes and destroys a great quantity and

does much injury to cultivated lands; but, as he is more timid upon earth than in the water, he is very easily driven away; and, as his legs are short, he cannot save himself well by flight if he is far from any water. His resource, when he finds himself in danger, is to plunge himself into the water, and go a great distance before he re-appears. He commonly retreats from his pursuers; but if he is wounded he becomes irritated, and immediately facing about with great fury, rushes against the boats, seizes them with his teeth, often tears pieces out of them, and sometimes sinks them under water. "I have seen," says a traveller, "an hippopotamus open his mouth, fix one tooth on the side of a boat, and another to the second plank under the keel; that is, four feet distant from each other, pierce the side through and through, and in this manner sink the boat to the bottom. I have seen another, lying by the side of the sea-shore, upon which the waves had driven a shallop heavily laden, which remained upon his back dry, and which was again washed back by another wave, without the animal appearing to have received the least injury. When the Negroes go a fishing in their canoes, and meet with an hippopotamus, they throw fish to him; and then he passes on, without disturbing their fishery any more. He injures most when he can rest himself against the earth; but, when he floats in the water, he can only bite. Once, when our shallop was near shore, I saw one of them get underneath it, lift it above water upon his back, and overset it with six men who were in it, but fortunately they received no hurt."

"We dare not," says another traveller, "irritate the hippopotamus in the water, since an adventure happened which was near proving fatal to three men. They were going in a small canoc, to kill one in a river where there was about eight or ten feet water. After they had discovered him walking at the bottom, according to his custom, they wounded him with a long lance, which so greatly enraged him that he rose immediately to the surface of the water, regarded them with a terrible look, opened his mouth, and, at one bite, took a great piece out of the side of the canoe, and had very nearly overturned it; but he replunged, almost directly, to the bottom of the water."

These animals are only numerous in some parts of the world: it even appears that the species is confined to particular climates, and seldom to be met with but in the rivers of Africa. Dutch travellers say that they bear three

or four young ones; but this appears very suspicious; as the hippopotamus is of an enormous bulk, he is in the class of the elephant, the rhinoceros, the whale, and all other great animals, who bring forth but one; and this analogy appears more certain than all the testimonies that they have exhibited.

THE ELK AND THE REIN-DEER. Although the elk and the rein-deer are two animals of a different species, we have thought proper to unite them, because it is scarcely possible to write the history of the one without borrowing a great deal from the other.

It appears by positive testimonies, that the rein-deer formerly existed in France, at least in the high mountains, such as the Pyrenean, and, since that time, has been destroyed like the stags, who were heretofore common in that country. It is certain that the rein-deer is now actually to be found only in the most northern countries; we also know that the climate of France was formerly much more damp and cold, occasioned by the number of woods and morasses which are no longer to be seen. Gaul, under the same latitude as Canada, was, two thousand years ago, what Canada is at this present time; that is, a climate cold enough for those animals to live in.

The elk and the rein-deer, then, are only found in the northern countries; the elk on this, and the rein-deer on the other side of the polar circle in Europe and in Asia. We find them in America in the highest latitudes, because the cold is greater there than in Europe. The rein-deer can bear even the most excessive cold. He is found in Spitsbergen; he is common in Greenland, and in the most northern parts of Lapland: thus also, in the most northern parts of Asia, the elk does not approach so near the pole; he inhabits Norway, Sweden, Poland, Russia, and all the provinces of Siberia and Tartary, with the north of China. We again find him by the name of *original*, and the rein-deer under that of *caribou*, in Canada, and in all the northern parts of America.

We may form a sufficiently just idea of the elk and the rein-deer by comparing them with the stag. The elk is larger, stronger, and stands more erect upon his legs; his neck is shorter, his hair longer, and his antlers wider and heavier than those of the stag; the rein-deer is shorter and more squat; his legs are shorter and thicker, and his feet

wider ; the hair very thickly furnished, and his antlers much longer, and divided into a greater number of branches, with flat terminations ; while those of the elk are only (if the expression is allowed) cut or broached at the edges ; both have long hair under the neck, and both have short tails, and ears much longer than the stag ; they do not leap or bound like the roe-bucks ; but their pace is a kind of trot, so easy and quick, that they go over almost as much ground in the same time as the stags do, without being so much fatigued ; for they can trot in this manner for a day or two. The rein-deer lives upon the mountains ; the stag only dwells in low lands and damp forests ; both go in herds, like the stags, and both can be easily tamed, but the rein-deer with greater ease than the elk ; the last, like the stag, has not lost his liberty, while the rein-deer is become domestic among the enlightened part of mankind. The Laplanders have no other beast. In this icy climate, which only receives the oblique rays of the sun, where there is a season of night as well as day, where the snow covers the earth from the beginning of autumn to the end of spring, and where the verdure of the summer consists in the bramble, juniper, and moss, could man form any idea but of famine ? The horse, the ox, the sheep, all our useful animals, find no subsistence there, nor can resist the rigour of the cold : he has been obliged to search among the inhabitants of the forest for the least wild and most profitable animals. The Laplanders have done what we ourselves should do, if we were to lose our cattle : we should then be obliged to tame the stags and the roe-bucks of the forests, to supply their place ; and I am persuaded we should gain our point, and we should presently learn to draw as much utility from them as the Laplanders do from the rein-deer. We ought to be sensible, by this example, how far Nature has extended her liberality towards us. We do not make use of all the riches which she offers us : the fund is much more immense than we imagine. She has bestowed on us the horse, the ox, the sheep, and all our other domestic animals, to serve us, to feed us, and to clothe us ; and she has, besides, species in reserve which would be able to supply this defect, and which would only require us to subject them, and to make them useful to our wants. Man does not sufficiently know what Nature can do, nor what can be done with her. Instead of seeking for what he does not know, he likes better to abuse her in what he does know.

In comparing the advantages which the Laplanders derive from the tame rein-deer, with those which we derive from our domestic animals; we shall see that this animal is worth two or three of them : he is used, as horses are, to draw sledges and other carriages; he travels with great speed and swiftness; he easily goes thirty miles a day, and runs with as much certainty upon frozen snow as upon the mossy down. The female affords milk more substantial and more nourishing than that of the cow; the flesh is very good to eat; his coat makes an excellent fur, and his dressed hide becomes a very supple and very durable leather. Thus the rein-deer alone affords all that we derive from the horse, the ox, and the sheep.

The antlers of the rein-deer are larger, more extended, and divided into a greater number of branches than those of the stag. His food, in the winter season, is a white moss which he finds under the snow, and which he ploughs up with his horns or digs up with his feet.

In summer he lives upon the buds and leaves of trees, rather than herbs, which his forward-spreading antlers will not permit him to browse on with facility. He runs upon the snow, and sinks but little, on account of his broad feet. These animals are mild; and they bring them up in herds, which turns out greatly to the profit of their keepers. The richest Laplanders have herds of four or five hundred head of rein-deer, and the poor have ten or twelve. They lead them to pasture, and re-lead them to the stable, or shut them up in parks during the night, to shelter them from the outrages of the wolves. If they attempt to change their climate they die in a short time. Formerly Steno, prince of Sweden, sent six to Frederick, Duke of Holstein; and, of later date, in 1533, Gustavus, king of Sweden, had ten brought over to Prussia, both males and females: all perished without producing any young, either in a domestic, or in a free state.

There are both wild and tame rein-deer in Lapland. In the time the heat is upon the tame females, they sometimes let them loose, to seek the wild males; and, as these wild males are more robust, and stronger than the tame, the issues of this mixture are preferred for harness. These rein-deer are not so gentle as the others; for they not only sometimes refuse to obey those who guide them, but they often turn furiously upon them, attack them with their feet, so that there is no other resource than to cover themselves from their rage by the sledge, until the fury of the beast is subsided.

This sledge is so light, that they can easily manage it, and cover themselves with it. The bottom of it is lined with the skins of young rein-deers; the hairy side is turned against the snow, so that the sledge glides easily forwards, and recoils less on the mountains. The harness of the rein-deer is only a thong of the hide, with the hairs remaining on it, round the neck, whence it descends towards the breast, passes under the belly, between the legs, and is fastened to a hole which is in the fore part of the sledge. The Laplander has only a single cord by which to guide the animal, and which he throws indifferently upon the back of the beast, sometimes on one side, and sometimes on the other, according as he would direct him to the right or to the left. They can travel four or five miles an hour; but the quicker the method of travelling is the more it is inconvenient; a person must be well accustomed to it, and travel often, to be able to direct the sledge, and prevent it from turning over.

The rein-deers have outwardly many things in common with the stags; and the formation of the interior part is the same. The rein-deer sheds his antlers every year like the stag, and, like him, is very good venison. The females, both of the one and of the other species, go eight months with young, and produce but one at a birth. The young rein-deer follows his mother during the first two or three years, and does not attain his growth till about the age of four or five. It is at this age that they begin to dress and exercise them for labour.

The rein-deers are all very spirited, and very difficult to manage; they therefore make use only of those which are castrated, among which they choose the liveliest and the swiftest to draw their sledges, and the more heavy to travel with their provision and baggage at a slower pace. These animals are troubled with an insect, called the gad-fly, during the summer season, which, burrowing under their skins the preceding summer, deposit their eggs; so that the skin of the rein-deer is often so filled with small holes, that an incurable disorder is brought on.

The herds of this species require a great deal of care. The rein-deer are subject to elope, and voluntarily renew their natural liberty; they must be closely attended, and narrowly watched; they cannot lead them to pasture but in open places; and, in case the herd are numerous, they have need of many persons to guard them, to recall them, and to run after them, if they stray. They are all marked, that

they may be known again ; for it often happens, that they stray in the woods, or mix among another herd. In short, the Laplanders are continually occupied in the care of their rein-deer, which constitute all their wealth.

The rein-deer is the only animal of this species the female of which has horns like the male ; and the only one also which sheds his horns, and renews them again, notwithstanding his castration ; for, in stags, fallow-deer, and roebucks, who have undergone this operation, the head of the animal remains always in the same state in which it was the moment it was castrated.

Another singularity, which we must not omit, and which is common to the rein-deer and the elk, is, that when these animals run, or quicken their pace, their hoofs, at every step, make a crackling noise, as if all the joints of their legs were disjoining. It is this noise, or perhaps the scent, which informs the wolves of their approach, who run out to meet and seize them ; and, if the wolves are many in number, they very often conquer. The rein-deer is able to defend himself against a single wolf, not, as may be imagined, with his horns (for they are rather of a disservice to him than of use,) but with his fore feet, which are very strong, and with which he strikes with such force, as to stun the wolf, or drive him away ; after which he flies with such speed, as to be no longer in any danger of being overtaken : but he finds a more dangerous, though a less frequent, and less numerous enemy than the wolf, in the *rosomack*, or *glutton*.

The elk and the rein-deer are both among the number of ruminating animals.

A tame rein-deer lives only to the age of fifteen or sixteen years ; but it is to be presumed, that the life of the wild rein-deer is of much longer duration. This animal, being four years before he arrives at his full growth, must live twenty-eight or thirty years, when he is in his natural state. The Laplanders hunt the wild rein-deers by different methods, according to the difference of seasons. In rutting time, they make use of a tame female to attract them. They kill them by the musket, or with the bow and arrow, and draw the bow with such strength, that notwithstanding the thickness of the hair, and the firmness of the hide, they very often kill one of these beasts with a single arrow.

In general, the ELK is a much larger and a much stronger animal than the stag and the rein-deer. His hair is so

rough, and his hide so hard, that a musket ball cannot penetrate it. His legs are very firm, with so much motion and strength, especially in the fore-feet, that he can kill a man by one single stroke of his foot; nevertheless, he is hunted nearly as we hunt the stag; that is, with men and dogs. It is affirmed, that, when he is touched with the lance, or pursued, it happens that he often falls down all at once, without either being pulled down or wounded. From this circumstance, some have presumed he was subject to the epilepsy; and on this presumption, which is not well founded, (since fear alone might be able to produce the same effect,) this absurd consequence has been drawn, that his hoof is a remedy for the epilepsy, and even preserves persons from it.

As there are very few people in the northern parts of America, all animals, and particularly elks, are in greater numbers than in the north of Europe. The savages are not ignorant of the art of hunting and taking them; they follow them by the track of their feet, very often for many days together, and by constancy and dexterity they often gain their end. Their method of hunting them in winter is particularly singular:—"They make use of rackets, or snow-shoes," says Denys, "by means of which they walk upon the snow without sinking in. The *original* does not cover a deal of ground, because of his sinking in the snow, which greatly fatigues him; he eats nothing but the young shoots of the trees during the whole year; therefore, where the savages find the trees eaten, they presently meet with the beasts, which they approach very easily. They throw a dart at them, which is a large club, at the end of which is fastened a large pointed bone, which pierces like a sword. If there are many originals in one troop, they drive them away;—for then the originals, placing themselves in a rank, describe a large circle of a mile and a half, or two miles, and sometimes more. They harden the snow so much with their feet in turning round, that they no longer sink in. The savages in America wait for their passing them, and then throw their darts, and kill them."



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CHAP. XVIII.

Of the Ibex—The Chamois, and other Goats—The Saiga—The Antelope, or Gazelle—Of the Bezoar Stone—Of the Bubalus, or Stag like Antelope—The Condoma, or striped Antelope—The Guib, or harnessed Antelope—The Grimm—The Chevrotins—The Masame, and Temamacame—The Coudus, or Indian Antelope—The Gnu—The Musk—The production of that perfume.

THE IBEX, THE CHAMOIS, AND OTHER GOATS.

ALTHOUGH it appears, that the Greeks were acquainted with the Ibex and the Chamois, yet they have not described them by any particular denomination, nor even by characters sufficiently exact for them to be distinguished by: they have only indicated them under the general name of *wild goats*. They probably presumed, that these animals were of the same species as the domestic goats, as they have not given them proper names, as they have done to every other different species of animals: on the contrary, all our modern naturalists have regarded the ibex and the chamois as two real and distinct species, and both of them different from that of our goats.

The male ibex differs from the chamois, by the length, thickness, and the form of the horns; it is also much more bulky, vigorous, and strong. The female ibex has horns different from the male; they are also much smaller, and nearly resembling those of the chamois. In other respects, these two animals have the same customs, the same manners, and the same country; only the ibex, as he is endowed with more agility, and is stronger than the chamois, climbs to the summit of the highest mountains; while the chamois only lives in the second stage; but neither the one nor the other is to be found in the plains; both make their way on the snow; both ascend precipices by bounding from rock to rock; both are covered with a firm and a solid skin, and clothed, in winter, with a double fur, with very rough hair outwardly, and a finer and thicker hair underneath; both of them have a black stripe on the back, and both likewise have the tail nearly of the same size. The number of exterior resemblances is so great, in comparison with the differences, and the conformity of the exterior parts is so complete, that

if we reason in consequence of these accounts, we might be led to believe, that these two animals are not really of a different species, but that they are simply only constant varieties of one and the same species. The ibex, as well as the chamois, when taken young and brought up with domestic goats, are easily tamed; and, accustomed to domesticity, imbibe the same manners, herd together, return to the stable, and probably copulate together. I avow, however, that this fact, the most important of all, and which alone would decide the question, is not known to us.

Let us, nevertheless, take a view of the opposite reasons. The species of the ibex and the chamois both subsist in a state of nature, and both are constantly distinct. The chamois sometimes comes, of his own accord, and joins the stock of our domestic sheep. The ibex never joins them, at least not before it is tamed. The ibex and the he-goat have a very long beard, and the chamois has none at all, the male and female chamois have very small horns; those of the male ibex are so thick and so long, that they would scarcely be imagined to belong to an animal of its size. The horns of the male ibex are not very different from those of the goat; as the female, however, approaches our goat, and even the chamois, in the size and smallness of the horns, may we not conclude that these animals, the chamois and the domestic goat, are, in fact, but one and the same species, in which the nature of the females is invariably and alike, while the males are subject to varieties, which render them different one from the other?

The ibex, or wild goat, entirely and exactly resembles the domestic goat, in the conformation, the organization, and the natural and physical habits; it only varies by two slight differences; the one externally, and the other internally. The horns of the ibex are longer than those of the he-goat; they have two longitudinal ridges; those of the goat have but one; they have also thick knots, or transverse tubercles, which mark the number of years of their growth, while those of the goats are only marked with transverse strokes. The ibex runs as fast as the stag, and leaps lighter than the roe-buck. All goats are liable to vertigos, which are common to them with the ibex and the chamois, as well as the inclination to climb up rocks; and still another custom, which is that of continually licking the stones, especially those which are strongly impregnated with salt-

petre, or common salt. In the Alps there are rocks which have been hollowed by the tongue of the chamois. These are commonly soft and calcinable stones, in which, as is well known, there is always a certain quantity of nitre. These natural agreements, these conformable customs, among other circumstances, appear to me to be sufficient indexes of the identity of species in these animals.

The ibex and the chamois, one of which I look upon as the male, and the other as the female stock of the goat species, are only found, like the mufloon, who is the source of the sheep species, in desarts, and upon the most craggy places of the highest mountains: the Alps, the Pyrenees, the mountains of Greece, and those of the islands of the Archipelago, are almost the only places where the ibex and the chamois are to be found. But, although both these animals dislike heat, and only inhabit the region of snow and ice, yet they have also an aversion to excessive cold. In the summer they choose the north of the mountains; in winter they descend into the valleys; neither the one nor the other can support themselves on their legs upon the ice, when it is smooth; but, if there be the least inequalities on its surface, they bound along with security.

The chase of these animals is very troublesome, and dogs are entirely useless in it; it is likewise very dangerous to men; for sometimes the animal, finding itself hard pushed, turns and strikes the hunter, and precipitates him from the rock. The chamois is as swift, but not so strong as the ibex: the species of this last is more numerous; and they commonly go in herds; there are, however, less at this present time than there were formerly, at least in the Alps and Pyrenean mountains.

Mr. Perond, surveyor of the crystal mines in the Alps, having brought over a living chamois, has given us the following information on the natural habits of this animal:—"The chamois is a wild animal but easily tamed, and very docile. It is about the size of a domestic goat, and resembles one in many respects. It is most agreeably lively, and active beyond expression. Its hair is short, like that of the doe; in spring it is of an ash-colour, and in winter of a blackish brown. The large males keep themselves apart from the rest, except in their rutting time. The time of their coupling is from the beginning of October to the end of November; and they bring forth in April and March. The young follows the dam for about five months, and sometimes longer, if the hunters or the wolves do not

separate them. It is asserted that they live between twenty and thirty years. The flesh of the chamois is good to eat; and some of the fattest afford ten or twelve pounds of suet, which far surpasses that of the goat in solidity and goodness.

The cry of the chamois is not distinctly known; if it has any it is but faint, and resembling that of a hoarse goat; it is by this cry it calls its young; but, when they are frightened, or are in danger of any enemy, or some other object not perfectly known to them, they warn the rest of the flock by a kind of hissing noise. It is observable, that the chamois has a very penetrating eye, and its hearing and smell are not less distinguishing. When it finds an enemy near, it stops for a moment, and then in an instant flies off with the utmost speed. When the wind is in its favour it can smell a human creature for more than half a mile distance. When this happens, therefore, and it cannot see its enemy, but only discovers his approach by the scent, he begins the hissing noise with such force, that the rocks and the forests re-echo with the sound. This hissing continues as long as the breath will permit. In the beginning it is very shrill, and deeper towards the close. This animal then rests a moment, after this alarm, to inspect farther into its danger: and, having confirmed the reality of its suspicion, it commences to hiss by intervals, till it has spread the alarm to a great distance. During this time it is in the most violent agitation, strikes the ground forcibly with its fore-foot, and sometimes with both; it bounds from rock to rock; it turns and looks round; it turns to the edge of the precipice, and when it has obtained a sight of the enemy, flies from it with all its speed. The hissing of the male is much more acute than that of the female; it is performed through the nostrils, and is, properly, no more than a very strong breath, forced through the nostrils by fixing the tongue to the palate, keeping the teeth nearly shut, the lips open, and a little lengthened. The chamois feeds upon the best herbage, and chooses the most delicate parts of plants, flowers, and the most tender buds. It is not less delicate with regard to several aromatic herbs, which grow upon the sides of the Alps. It drinks but very little while it feeds upon the succulent herbage, and ruminates, like the goat, in the intervals of feeding. Its head is crowned with two small horns, of about half a foot long, of a beautiful black, and rising from the forehead, almost betwixt the eyes. These horns are often made use of for the heads of canes. The

hides of these animals are very strong and supple, and good warm waistcoats and gloves are made of them.

The hunting of the chamois is very laborious, and extremely difficult. The most usual way of taking them, is, by hiding behind some of the clefts of the rocks, and shooting them. The sportsman is obliged to take great precaution in this business, and to creep for a vast way upon his belly, observing, at the same time, to keep the wind in his face. When he is got within a proper distance, and properly secured from sight, he only advances his head and arms, with the piece, from his hiding place, and fires among them: others hunt this animal, as they do the stag, by placing proper persons at all the passages of the place or valley, and then sending in others to rouse the game.

THE SAIGA. There is a sort of wild goat, found in Hungary, in Tartary, and in South Siberia, which the Russians call *Seigak*, or *Saiga*. It bears a resemblance to the domestic goat in the shape of its body, and in its hair; but, by the shape of the horns, and the defect of the beard, it approaches nearer the *gazelle*, and appears to be a mixture of these two animals.

The saiga, by its natural habits, resembles more the gazelle than the ibex and the chamois; for it does not delight in mountainous countries, but lives upon the hills and on the plains. It is very agile, very swift, and its flesh is much better eating than that of the ibex, or any other wild or tame goat.

THE GAZELLE OR ANTELOPE. There have been thirteen species, or at least thirteen very distinct varieties, noted of these animals. In this uncertainty, in knowing whether they are only varieties, or in fact really different species, we have thought proper to put them all together, assigning to each of them a particular name. The first is the common *gazelle*, found in Syria, in Mesopotamia, and in all the other provinces of the Levant, as well as in Barbary, and in all the northern parts of Africa. The horns of this animal are about a foot long, entirely annulated at the base, which lessen into half rings towards the extremity; they are not only surrounded with these rings, but also longitudinally furrowed by small streaks. These rings mark the number of years of their growth, which is commonly about twelve or thirteen. The gazelles in general, and this tribe in particular, greatly resemble the

roe-buck, in the proportions of the body, its natural functions, its swiftness, and the brightness and beauty of its eyes. These resemblances would tempt us to think that, as the roe-buck does not exist where the gazelle does, the latter was only a degeneration of the first; or that the roe-buck is only a gazelle, whose nature is altered by the influence of the climate, and by the effect of the different food, did not the gazelle differ from the roe-buck in the nature and fashion of its horns; those of the roe-buck, which may be said to be solid, fall off, and are renewed every year, like those of the stag: on the contrary the horns of the gazelle are hollow and permanent, like those of the goat; the roe-buck has also no gall-bladder, which is to be found in the gazelle, as well as in the goat: on the other hand, the gazelles have, in common with the roe-buck, deep pits under the eyes, and resemble it still more in the colour and quality of the hair, in the bunches upon their legs, which only differ in being upon the fore-legs of the gazelle, and upon the hinder-legs of the roe-buck. The gazelles, therefore, seem to be of a middle nature between the two animals; but, when we consider that the roe-buck is an animal which is to be found in both continents, and that the goats, on the contrary, as well as the gazelles, do not exist in the New World, we shall easily perceive that these two species, the goat and the gazelle, are more nearly related to each other than they are to the roe-buck.

The second gazelle is an animal found in Senegal, and is called the *kevel*. It is something less than the former, and nearly of the size of a small roe-buck; it differs also in its eyes, which are much larger; and its horns, instead of being round, are flattened on the sides, as well in the male as in the female; in other respects, the kevel entirely resembles the gazelle.

The third animal is called the *corin*, the name it bears in Senegal. It greatly resembles the gazelle and the kevel, but is still less than either; its horns also are much smaller, and smoother than those of the other two; and the annular prominences belonging to this kind are scarcely discernible.

In the Royal Cabinet of France, there are skins of these three different gazelles; besides which is a horn which bears a great resemblance to those of the gazelle and kevel, and only differs from them in being much thicker. Its thickness and length seem to indicate a much larger animal than the

common gazelle; and it appears to us to belong to a gazelle which the Turks call *txeran*, and the Persians *atur*. This animal, according to Olearius, in some measure, resembles our deer, except that it is rather of a red colour than brown; the horns, likewise, are without antlers, and rest upon the back, &c. Mr. Gmelin, who describes it under the name of *doheren*, says, it resembles the roe-buck, with this exception, that the horns are like those of the ibex, hollow, and, like them, never fall off.

To the four first species or tribes of gazelles, must be added two other animals, which resemble them in many things. This first is called *koba* at Senegal, where the French have styled it the *great brown cow*. The second, which we call the *kob* is also an animal of Senegal, which the French have denominated the *small brown cow*. The horns of the kob greatly resemble those of the gazelle and the kevel; but the shape of the head is different; the muzzle is much longer, and there are no pits nor depressions under the eyes.

The seventh animal of this kind is a gazelle which is found in the Levant, but more commonly in Egypt, and in Arabia. It is called, from its Arabian name, *algazelle*; it is shaped pretty much like the other gazelles, and is nearly of the size of a deer; but its horns are long, small, and but little rounded till towards the extremity, when they turn short with a sharp flexure; they are black, and almost smooth, and the annular prominences scarcely observable, except towards the base, where they are a little more visible. They are about three feet in length, while those of the gazelle are commonly but one foot, those of the kevel fourteen and fifteen inches, and those of the corin, (which nevertheless, resembles this the most) only six or seven inches.

The seventh animal is that which is vulgarly called the *Bezoar gazelle*, but by the eastern nations *pasan*, which name we retain. This gazelle is of the size of our domestic he-goat; and it has the hair, shape, and agility of the stag. In most respects, these two species, the *algazelle* and the *pasan*, appear to us to have a great affinity. They are also natives of the same climate, and found in the Levant, in Egypt, in Barbary, in Arabia, and Persia; but there is this difference: the *algazelle* feeds upon the plains, and the *pasan* is only found in the mountains. The flesh of both is very good food.

The ninth gazelle is an animal which is called *nanguer* at Senegal. It is three feet and a half long, two feet and a half high; it is of the colour of the roe-buck, fallow upon the upper part of the body, white under the belly and upon the hinder parts, with a spot of the same colour on the neck. Its horns are prominent, like those of the other gazelles, and are about six or seven inches in length: they are black and round; but what is very particular in them is, that near the points they are crooked forwards, nearly as those of the chamois are bent backwards. These nanguers are very beautiful animals, and very easy to tame.

The tenth gazelle is a very common animal in Barbary, and in Mauritania, and so well known to the English, that they have given it the name of the *antelope*. This animal is of the size of a roe-buck, and greatly resembles the common gazelle and the kevel, yet differs from them in many particulars, so as to be looked upon as an animal of a different species. This antelope has deeper eye-pits than the common gazelle; its horns are about fourteen inches long, almost touching each other at the bottom, spreading as they rise, so as, at their tips, to be sixteen inches asunder. They have the annular prominences of the gazelle and the kevel, but not so distinguishable as in those. But what serves particularly to distinguish this antelope is the double flexure, very uniform and remarkable, so that the two horns make a tolerable representation of an antique lyre.

In reviewing all the animals of this class, we find there are about twelve species, or distinct varieties, in the gazelles; and, after having carefully compared them, we suppose, first, that the common gazelle, the kevel, and the corin, are only three varieties of one species; secondly, that the tzeiran, the koba, and the kob, are all three varieties of another species; thirdly, we presume, that the algazelle, and the pasan, are only two varieties of the same species; and we imagine, that the name *Bezoar gazelle*, which has been given to the pasan, is no distinctive character; for we think ourselves able to prove, that the Oriental bezoar does not come from the pasan alone, but from all the gazelles and goats which live in the mountains of Asia; fourthly, it appears, that the nanguers, whose horns are crooked forwards, and who, together, compose two or three particular varieties, have been indicated by the ancients under the

name of the *dama* ; and, fifthly, that the antelopes, which are about three or four in number, and which differs from all others, by the double flexure of their horns, have also been known to the ancients by the names of *strepsicheros*, and of *addax*.

The gazelles are hunted not only with dogs, assisted by the falcon, but also, in some countries, with the ounce. This fine animal, tamed for the purpose, generally goes with the hunter ; and when the prey is near, they chain it, and shew it the gazelles. It immediately exerts all its arts and fierceness in the pursuit, not as might be supposed, by running after them, but by turning and winding about with the utmost cunning, till it is near its prey, when it bounds all at once upon the gazelle, strangles it instantaneously, and sucks its blood. If it misses its aim, which often happens, it rests in the place, nor attempts to pursue them any further ; perhaps from the instinct, that, as they can run much swifter, and a longer time, the chase would be useless. The master then draws near the ounce, coaxing it, and flinging it some pieces of flesh, until he is near enough to chain, and bring it back to its former station.

In some places, they take the wild gazelles by means of a tame one, to the horns of which they fasten a snare made of cord. When a herd of gazelles is found, the tame one is sent among the rest ; it no sooner approaches than the males of the wild herd advance to oppose him, and, in butting with their horns, are entangled in the noose. In this struggle they both commonly fall to the ground, when the hunter coming up kills the one, and disengages the other.

The antelope, especially the largest sort, are much more common in Africa than in India ; they are stronger and fiercer than the other gazelles, from which they are easily distinguishable by the double flexure of their horns ; they have also no black or brown streaks on their sides. The middling-sized antelope is about the size and colour of the deer ; their horns are very black, their body very white, and their fore-legs shorter than the hinder ones. They are well made, and only sleep in dry and clean places ; they are likewise very swift, very watchful, and very apprehensive of danger ; so that, in open places, when they see a man, a dog, or any other enemy, they fly, with all their swiftness, till they are out of danger. But, notwithstanding this natural timidity, they have a kind of

courage if they are surprised, when they turn short round, and face the enemy that attacks them with great firmness.

The bezoar stone is the production not only of gazelles, but of wild and domestic goats, and even sheep. Probably the formation of this stone depends more on the temperature of the climate, and the quality of the food, than on the nature or species of the animal. Some authors have asserted, that the true occidental bezoar, i. e. that which possesses most virtue, is the production of monkeys, and not of gazelles, goats, or sheep. But this opinion is not founded on a proper basis; for we have seen many of these concretions, to which the name of *monkey bezoar* has been given, quite different from the *oriental bezoar*, which is certainly produced by a ruminating animal, and which is easily distinguishable from all other bezoars, by its shape, substance, and colour, which is generally of an olive brown without and within; while the *occidental bezoar* is of a pale yellow; the substance of the first is also softer and finer; that of the last harder and drier. The oriental bezoar has been prodigiously in vogue, and a great consumption has been made of it in the last century; and since it has been made use of in Europe and in Asia, for all cases in which our present physicians give cordial medicines, and other antidotes, may we not presume, by the great quantities which formerly have been, and by what at present is consumed, that this stone is produced not from a single species of animal, but from many; and that it is equally the production of gazelles, goats, and sheep, who cannot produce it but in certain climates of the Levant and Indies.

This stone is formed, as is well known, by concentrical layers, and often contains some foreign matter, even from the circumference to the very centre. We have enquired into the nature of this matter, which serves as a nucleus to the oriental bezoar, from which a judgment may be formed of the kind of animal that has swallowed them. This nucleus is of various kinds, sometimes pieces of flint, tamarinds, grains of cassia, pieces of straw, and the young buds of trees in particular; therefore, from the above facts, we can attribute this production only to those animals which browse upon shrubs and leaves.

Garcius ab Horte says, that in Chorrason, and in Persia, there is a kind of goats called pasans, and that it is in their stomachs that the bezoar is formed; for, in

the great number of goats that are killed for the subsistence of the troops, the stones are eagerly sought after in the stomachs of these animals, and very commonly found there.

With respect to the occidental bezoar, we can affirm, that they proceed neither from goats nor gazelles, nor even any animal of that kind, in all the extent of the New World. Instead of gazelles, we only meet with roebucks in the woods of America; instead of wild goats and sheep, animals of a quite different nature are seen on the mountains of Peru and Chili, viz. the lamas, and the pacos.

Mr Daubenton, who has more narrowly inspected into the nature of bezoar stones than any other person, thinks that they are composed of a matter similar to that which fastens itself to the teeth of ruminating animals, in form of a shining tartareous matter.

The chamois, and perhaps the ibex of the Alps, the goats of Guinea, and many other animals of America, afford bezoar; and, if we comprehend under this name, all concretions of this nature which is met with in different animals, we may be assured, that most quadrupeds, excepting carnivorous ones, produce bezoar, which is even to be found in crocodiles and alligators.

To form, therefore, a clear idea of these concretions, it will be necessary to divide them into many classes, and fix them to the animals which produced them, observing, at the same time, the climate, and the food, which mostly assisted this kind of production.

First, then, the stones which are found in the bladder, and in the reins of men, and other animals, must be held distinct from the bezoar class, and described by the name of *calculi*, their substance being quite different from that of the bezoar; they are easily known by their weight, their urinous smell, and their composition, which is not regular, nor formed with concentrical layers, like that of the bezoar.

2. The concretions that are often found in the gall-bladder, and in the liver of the human species, and of the brute creation, must not be regarded as bezoar stones, they being easily distinguishable from them by their lightness, their colour, and their inflammability; and, besides, they are not formed by layers encircled round, or nucleuses, like the bezoar.

3. The balls that are often found in the stomach of animals, and especially in those that ruminate, are not true bezoars. These balls, which are called *egagropiles*, are composed internally of the hair the animal has licked off, and swallowed, or from the hard roots which he has fed upon, and which he could not digest; their external part is encrusted with a viscous substance, something similar to that of the bezoar. The *egagropiles*, therefore, having nothing in them, except this external layer, of the bezoar; and a single inspection is sufficient to distinguish the one from the other.

4. *Egagropiles* are often found in the animals of temperate climates, but scarcely over any bezoar. Animals of hotter countries, on the contrary, only produce bezoar: the elephant, the rhinoceros, the goats, the gazelles of Asia and Africa, the lama of Peru, and others, produce, instead of *egagropiles*, solid bezoar, whose substance and size varies relatively according to the difference of the animals and the climates.

5. The bezoar to which the greatest virtues and properties has been attributed, is the Oriental bezoar, which, as we have said, proceeds from the goats, gazelles, and sheep, which feed on the mountains of Asia. The bezoar of an inferior quality, and which is called *occidental*, is produced from lamas and pacos, which are to be found in the mountains of South America. In short, the goats and gazelles of Africa also produce bezoar, but not of so good a quality as those of Asia.

From all these circumstances, we may conclude, that, in general, the bezoar is only a residue of the vegetable nutriment, which is not to be found in carnivorous animals, and which is only produced in those who feed on plants; that in the mountains of Southern Asia, the herbage being stronger than in the other parts of the world, the bezoar, which is made from the residue of that food, has also more virtues than any other; that in America, where the heat is less, the grass of the mountains being weaker, the bezoars produced there are inferior to the first; and in Europe, where the grass is still weaker, and in all the valleys of both continents, no bezoar is produced, but only *egagropiles*, which contain nothing but hair or roots, and very hard filaments, which the animal was unable to digest.

THE BUBALUS, OR STAG-LIKE ANTELOPE, resembles the stag, the gazelle, and the ox, in many very remarkable respects; the stag in the size and shape of its body and legs, in particular; but its horns are permanent, and made nearly like those of the largest gazelles; which animal it also resembles in its natural habits: its head, however, is much longer than the gazelle's, and even than the stag's; and it resembles the ox by the length of the muzzle, and the disposition of the bones of the head.

The horns of the bubalus are crooked backwards, and twisted like a corkscrew. The shoulders are elevated, so that they form a sort of hunch upon the withers. The tail is almost a foot long, and furnished with a quantity of hair at its extremity.

The hair of the bubalus is like that of the elk, fine towards the root, thick in the middle and extremity. This character is particular to these two animals; for the hair of almost every quadruped is thicker at the root than at the middle and point. The hair is nearly of the same colour as the elk, though much shorter, thinner, and softer; and these alone are the resemblances between the bubalus and the elk.

The bubalus is common in Barbary, and in all the northern parts of Africa. It is nearly of the same nature as the antelope, and has, like that, short hair, and a black hide and flesh which makes very good food.

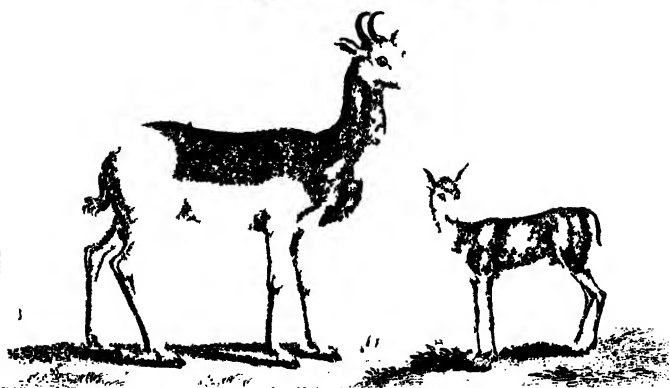
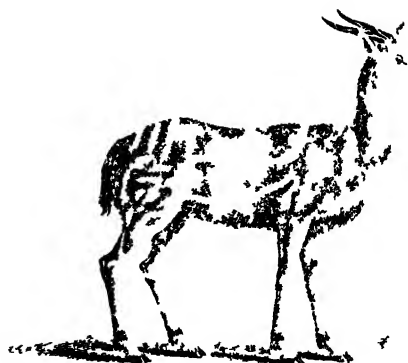
CONDOMA, OR STRIPED ANTELOPE. The Marquis de Marigny had, in his cabinet, the head of an animal, which, at first sight, I supposed to have belonged to a great bubalus. It is like those of our largest stags; but the horns, instead of being solid like those of the stag, are large and hollow, with a ridge like those of the goat kind, and with varied flexures like those of the antelope. In examining the royal cabinet for what might be there relative to this animal, two horns were found which belonged to it; the first, without any mark or name, came from his Majesty's wardrobe; the second was given in 1760, by M. Bauchis, Commissary of the marines, with the name of the Condoma of the Cape of Good Hope affixed to it.

In looking over the works of travellers, for those marks which might have an affinity with the remarkable size of the horns of this animal, we can find none which have a nearer relation to it than those of the animal indicated by

Kolbe, by the name of the *wild goat* of the Cape of Good Hope.—“ This goat,” he says, “ to which the Hottentots have not as yet given a name, and which I call the *wild goat*, is very remarkable in many respects. It is about the size of a large stag ; its head is very handsome, ornamented with two crooked and pointed horns, about three feet long, and, at their extremities, about three feet asunder. All along the back there runs a white list, which ends at the insertion of the tail ; another of the same colour crosses this at the bottom of the neck, which it entirely surrounds. There are two more running round the body, one behind the fore-legs, and one parallel to it, before the other. The colour of the rest of the body is greyish, except the belly, which is white. It has also a long grey beard ; and its legs, though long, are well proportioned.”

THE GUIB, OR HARNESSSED ANTELOPE is common in Senegal. It resembles the gazelles, especially the nanguer, by the size and shape of its body, by the fineness of its legs, by the shape of its head and muzzle, by the eyes, by the ears and length of its tail, and by the defect of a beard ; but every gazelle, especially the nanguer, has the belly white, while the breast and belly of the guib is of a deep brown. It also differs from the gazelles by the horns, which are smooth, and not marked with annular prominences. They are also a little compressed ; and the guib, in these particulars, is more like the goat than the gazelle ; nevertheless, it is neither the one nor the other, but of a particular kind, which seems to be intermediate between the gazelle and the goat. It is also remarkable for white lists on a brown ground, which are disposed along the animal's body, as if it were covered with a harness. It feeds in company ; and they are found in numerous herds in the plains of Pador.

THE GRIMM. This animal is only known to naturalists by the name of the *wild goat of Grimmus* ; and, as we are not acquainted with the name it bears in its own country, we cannot do better than adopt this precarious denomination. There are two characters which are sufficient to distinguish it. The first is a very deep cavity under each eye ; the second is a tuft of hair, standing upright on the top of the head. It resembles both the goat and the gazelle, not only in the shape of its body, but even in its



Gazelle or Horned Antelope Kudu or similar
Antelope Antelope

horns, which are annulated towards the base, and have longitudinal streaks, like those of the gazelles; at the same time they are very short, and bend backwards in an horizontal direction. There is some reason to think that the male grimm alone is furnished with horns. It is a native of Guinea.

THE CHEVROTINS. We have given the name of *chevrotin* (*tragulus*) to those small animals of the hotter countries of Africa and Asia, which almost every traveller has mentioned by the denomination of *small stags* or *little hinds*: in fact, the chevrotin is a miniature resemblance of the stag, by the shape of the muzzle, the delicacy of its body, the shortness of its tail, and the shape of its legs; but it differs greatly from it in the size, the largest chevrotins being never found longer than the hare. In other respects, the horns of those which have any, are hollow, annulated, and nearly resembling the gazelles. Their foot is cloven, and is also more of the gazelle than of the stag kind. They differ from the gazelle and the stag by not having any depressions or hollows under their eyes, and in that respect approach nearer the goat kind; but, in reality, they are neither stag, gazelle, nor goat, and constitute one or more distinct species. Seba gives the figures and the descriptions of five chevrotins: the first, the *small red Guinea kind, without horns*; the second, the *fawn, or small African stag*; the third, the *small young stag of Guinea*; the fourth, the *small red and white spotted hind of Surinam*; the fifth, the *red-haired African stag*. Of these five chevrotins mentioned by Seba, the first, second, and third, are evidently the same animal; the fifth, which is larger than the three first, and whose hair is redder, much longer, and of a deeper brown, seems to be only a variety of this species; the fourth, which the author indicates as an animal of Surinam, is probably only a second variety of this species, which is only found in Africa and in the southern parts of Asia.

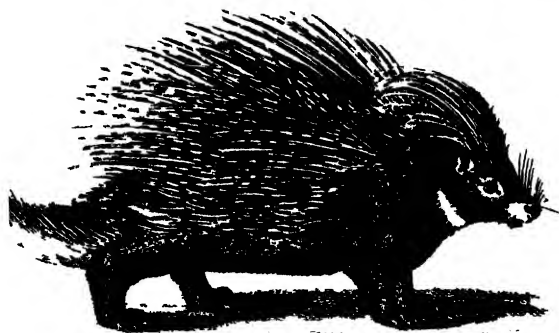
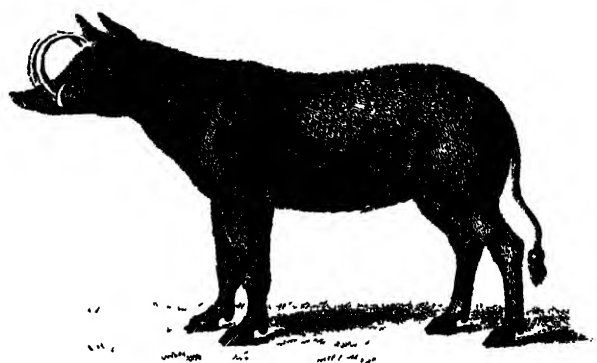
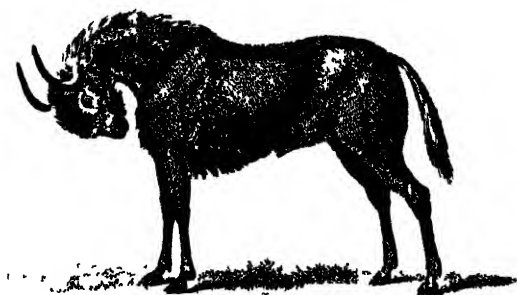
These animals are of an elegant make, and finely proportioned for their size. But though they leap and bound with prodigious swiftness, yet, apparently, they cannot continue it for a long time; for the Indians often hunt them down; and the Negroes likewise pursue them, and knock them down with their sticks. They are greatly hunted after, as their flesh is excellent food. They can

only live in excessively hot climates; and they are so exceedingly delicate, that it is with the greatest trouble they are transported into Europe alive, where they perish in a short time. They are easily tamed, very familiar, and beautiful. The chevrotin is, without doubt, the least of all cloven-footed animals. According to this character they should not bring forth many young; but, if we reason from their small size, we should imagine they brought forth several at a time. They are exceedingly numerous in the Indies, Java, Ceylon, Senegal, Congo, and in every other country that is excessively hot; and are not to be found in America, nor in any of the temperate climates of the Old Continent.

MAZAME, in the Mexican language, was the name of the stag, or rather of the whole race of stags, deer, and roe-bucks. Travellers distinguish two kinds of mazames, both common to Mexico and New Spain; the first and largest, to which they give the simple name of mazame, has a horn like that of the roe-buck of Europe, about six or seven inches in length, with the extremity divided into two points; the second, called *temamacame*, is less than the former, and has but a single horn, and without any antlers. These two animals seem to be roe-bucks; the first of which is absolutely of the same species as the European roe-buck, and the second no more than a variety of it.

THE COUDOUS, OR INDIAN ANTELOPE. Of all animals those that chew the cud are the most numerous and most varied. In the very great quantity of horns collected together in the Royal Cabinet, or dispersed in private collections, there still remains one without label, without name, absolutely unknown, and of which we have no other indexes than those which we can draw from the subject itself. This horn is large, almost strait, and very thick and black. It is not solid like that of the stag, but resembles that of the ox. After seeking a number of different cabinets, we at last found, in that of Mr. Dupleix, a head adorned with two horns, resembling this we mention: this was labelled with these words—*The horns of an animal nearly like a horse, of a greyish colour, with a mane before its head. It is called at Pondicherry, COESPOES, which should be pronounced COUDOUS.*

The coudous may possibly be of the buffalo species;



Gua — 2. *Antilocapra* — 3. *Porcupine* ?

and the travellers in Africa, where the buffalo is as common as in Asia, more precisely mention a kind of buffalo, called *pacasse* at Congo, which, by the indexes, seems to us to be the coudous. "In the route from Louanda to the kingdom of Congo, we perceived," say they, "two *pacasses*, which are animals greatly resembling buffalos, and which roar like lions. The male and female go always together. They are white, spotted with red and black. Their ears are about half an ell long; and their horns are short. They neither fly at the sight of the human species, nor do them any injury, but only look at them as they pass by."

THE GNU. The genus of Antelope is almost infinitely extended, and probably embraces some animals not yet described. To this genus may perhaps be referred that singular quadruped which the Hottentots, from its voice, distinguish by the name of *gnu*. It is described by travellers as resembling in form the horse, the ox, and the stag. It is about the size of a small horse, that is, about four or five feet in height, and between five and six in length. The colour of the body, which is said to be finely proportioned, is a dark brown. Its limbs are slender. Its neck is longer than that of the ox, but neither so long nor so slender as that of the horse. Like the horse it is adorned with a mane, which is stiff and erect. Its head, however, resembles most that of the ox species. Besides the mane, it has also on the chin and breast a shaggy stiff hair, which is black, while the colour of the mane and tail is grey. It is a native of the southern parts of Africa, where it exists in a gregarious state, and in very large herds. It is a lively, capricious animal.

THE MUSK ANIMAL. To finish a complete history of goats, and other animals of this genus, there is only one remaining to be described, which is as famous as it is unknown. The animal we mean is that which produces the musk, which all modern naturalists, and the greatest part of travellers through Asia, have spoken of, some by the name of the stag, roe-buck, and musk-goat; others have considered it as a large chevrotin; and truly it seems to be of an ambiguous nature, participating of all the above animals, although, at the same time we can assert, that its species is different from all others. It is about the size of a small roe-buck, or gazelle; but its head is without

horns; and by this character it resembles the *memina*, or chevrotin of India. It has two great canine teeth or tusks in the upper jaw, by which it approaches the chevrotin; but, what distinguishes it from all other animals, is a kind of bag, about two or three inches in diameter, which grows near the navel, and into which a liquor filtrates which differs from the civet by its smell and consistence. Neither the Greeks nor Romans have made any mention of the musk animal; and Grew is the only person who has made an exact description of it from its skin. The description given by that author is as follows:

The musk stag is about three feet six inches in length from the head to the tail; and the head is about half a foot long; the neck seven or eight inches; the fore part of the head three inches broad, and like that of a greyhound; the ears are erect, like those of a rabbit, and about three inches long; the tail is not above two inches; the fore legs are about thirteen or fourteen inches high; it is cloven-footed, armed behind and before with two horny substances, but none on the hind feet.

The bladder or bag which contains the musk is about three inches long, two broad, and stands out from the belly about an inch and a half. The animal has twenty-six teeth. There is also a tusk, or canine tooth, about two inches and a half long, on each side of the upper jaw, which terminate in the form of a hook. It has no horns. It appears, further, that the hair of this animal is long and rough, the muzzle pointed, the tusks somewhat like those of the hog. By these marks it approaches the boar kind, and perhaps still more that of the *babiroussa*, which the naturalists have denominated the *Indian boar*. The American hog also, which we call *pecari*, has a bag or cavity on its back, containing plenty of a very odoriferous humour. In general, those animals which produce odoriferous liquors, as the badger, the castor, the pecari, the oudatra, the desman, the civet, the zibet, are not of the stag or goat kind. Thus we might be tempted to think, that the musk animal is nearer the hog species than that of the goat.

In respect to the matter of musk itself, its essence, that is, its pure substance, is perhaps as little known as the nature of the animal which produces it. All travellers agree that the musk is always mixed and adulterated with blood, or some other drugs, by those who sell it. The Chinese not only increase the quantity by this mixture,

but they endeavour likewise to increase the weight, by incorporating with it lead very finely ground. The purest musks, and that which is the most sought after, even by the Chinese themselves, is that which the animal deposits upon trees or stones, against which it rubs itself when the quantity renders it uneasy. The musk which is brought over in the bag is very seldom so good, because it is not yet ripe, or because it is only in their rutting season that it acquires all its strength and all its smell; and it is at this time the animal endeavours to disburthen itself of this pure matter, which then causes such violent itchings and irritations. A single grain of musk is sufficient to perfume a great quantity of other matter; and the odour expands itself to a very great distance. The smallest particle is sufficient to perfume a considerable space; and the perfume is so permanent, that, at the end of several years, it does not seem to have lost much of its power.

CHAP. XIX.

Of the Babiroussa, or Indian Hog—The Cabiai—The Porcupine—The Couando—The Urson—The Asiatic Hedge-hogs—The Cameleopard—The Lama, and Laco—The Sloth—The Surikat—The Tarsier—The Phalanger—The Coquallin—The Hamster—The Bobak—The Jerhoa—The Ichneumon—The Fossan—The Vansire—The Maki or Maucacau—The Lori—The Javelin Bat.

THE BABIROUSSA, OR INDIAN HOG.

ALL naturalists have regarded this animal as a kind of hog, though it has neither the head, shape, bristles, nor tail of a hog. Its legs are longer, and its muzzle shorter. It is covered with soft and short hair like wool; and its tail is terminated by a tuft of the same; its body is likewise not so thick and clumsy as that of the hog; its ears are short and pointed; but the most remarkable character, and what distinguishes it from all other animals, are four enormous tusks, or canine teeth, the teeth, the two shortest of which shoot out of the lower jaw, like those of the boar; the two others, which come from the upper jaw, pierce the cheeks, or rather the upper part of the lips, and rise crooked almost to the eyes. These tusks are of a very beautiful ivory, much smoother and finer, but not so hard as that of the elephant.

These quadruple and enormous tusks give these animals a very formidable appearance ; they are, however, less dangerous than our wild boars. They go, like them, in herds ; they have a very strong smell, by which they are easily discovered, and hunted with good success. They grunt terribly, defend themselves, and wound their enemy with their under tusks ; for the upper are rather of disservice than of use to them. Although wild and ferocious as the boar, they are tamed with great ease ; but their flesh, which is very good food, putrefies in a very short time. As their hair is fine, and their skin delicate, it is soon penetrated by the teeth of the dogs, who hunt them in preference to wild boars, and sooner accomplish their purpose. The babiroussa strikes its upper tusks into the branches of trees to rest its head, or to sleep standing. This habit it has in common with the elephant, who, in order to sleep in an erect posture, supports his head by fixing the end of his tusks in the holes which he makes his lodging.

The babiroussa differs still more from the wild boar by its natural appetites. It feeds upon grass and leaves of trees, and does not endeavour to enter gardens, to feed on beans, peas, and other vegetables ; while the wild boar, who lives in the same country, feeds upon wild fruits, roots, and often on the depredations it makes in gardens. These animals, who go alike in herds, never mix : the wild boars keep on one side, and the babiroussas on the other ; these walk quicker, and have a very fine smell. They often fix themselves against a tree to keep off the hunters and their dogs. When they are pursued for a long time, they make towards the sea, and, swimming with great dexterity, very often escape their pursuit ; for they swim for a very long time, and often to very great distances, and from one island to another.

The babiroussa is found not only in the island of Bouro, or Boera, near Amboyna, but also in many parts of Southern Asia and Africa ; as at Estrila, Senegal, Madagascar, &c. We have not had it in our power to convince ourselves that the female had not the two tusks which are so remarkable in the male ; but most authors, who have spoken of this animal, seem to agree in this circumstance.

THE CABIAL. This American animal has never yet made its appearance in England. It is not a hog, as naturalists and travellers pretend ; it even resembles it

only by trifling marks, and differs from it by striking characters. The largest cabiai is scarcely the size of a hog of eighteen months growth. The head is longer; the eyes are larger; the snout, instead of being rounded, as in the hog, is split like that of a rabbit or hare, and furnished with thick, strong whiskers; the mouth is not so wide; the number and form of the teeth are different; for it is without tusks: like the peccary, it wants a tail, and, unlike to all others of this kind, is in a manner web-footed, and thus easily fitted for swimming and living in water. The hoofs before are divided into four parts, and those behind into three; between the divisions there is a prolongation of the skin; so that the feet, when opened in swimming, can beat a great surface of water.

This animal, thus made for the water, swims there like an otter, seeks the same prey, and seizes the fish with its feet and teeth, and carries them to the edge of the lake to devour them with the greatest ease. It lives also upon fruits, corn, and sugar-canes. As its legs are broad and flat, it often sits upright upon its hind-legs. Its cry resembles more the braying of an ass than the grunting of a hog. It seldom stirs out but at night, and almost always in company, without going far from the sides of the water in which it preys. It can find no safety in flight; and, in order to escape its enemies which pursue it, it plunges into the water, remains at the bottom a long time, and rises at such a distance, that the hunters lose all hopes of seeing it again. It is fat; and the flesh is tender, but, like that of the otter, rather of a fishy taste; the head, however, is not bad; and this agrees with what is said of the beaver, whose exterior parts have a taste like fish.

The cabiai is quiet and gentle: he is neither quarrelsome nor ferocious with other animals. It is easily tamed, comes at call, and willingly follows the hand that feeds it. We do not know the time of their bringing forth their young, their growth, and consequently the length of life of this animal. They are very common in Guiana, as well as in Brazil, in Amazonia, and in all the lower countries of South America.

THE PORCUPINE. The name of this animal leads us into an error, and induces many to imagine, that it is only a hog covered with quills, when in fact, it only resembles that animal by its grunting. In every other respect, it differs from the hog as much as any other animal, as

well in outward appearance, as in the interior conformation. Instead of a long head and ears, armed with tusks, and terminated with a snout ; instead of a cloven foot, furnished with hoofs, like the hog, the porcupine has a short head, like that of the beaver, with two large incisive teeth in the fore-part of each jaw ; no tusks, or canine teeth : the muzzle is divided like that of the hare ; the ears are round and flat, and the feet armed with nails ; instead of a large stomach with an appendage in form of a caul, the porcupine has only a single stomach, with the large cœcum gut, the parts of generation are not apparent externally, as in the male hog ; its testes, and the other parts of generation, are likewise concealed in the body. By all these marks, as well as by its short tail, its long whiskers, and its divided lip, it partakes more of the hare, or beaver kind, than that of the hog. The hedge-hog, indeed, who is, like the porcupine, covered with prickles, is somewhat resembling the hog ; for it has a long muzzle, terminated by a kind of snout ; but all these resemblances being very distant, it seems that the porcupine is a peculiar and different species from that of the hedge-hog, the beaver, the hare, or any other animal with which it may be compared.

Travellers and naturalists have almost unanimously declared, that this animal has the faculty of discharging its quills, and wounding its foes at an immense distance ; that these quills have the extraordinary and particular property of penetrating farther into the flesh, of their own accord, as soon as ever the point has made an entrance through the skin. These stories, however, are all purely imaginary, and without the smallest foundation or reason. The error seems to have arisen from this animal raising its prickles upright, when he is irritated ; and, as there are some of them which are only inserted into the skin by a small pellicle, they easily fall off. We have seen many porcupines, but have never observed them dart any of their quills from them although they were violently agitated. We cannot, then, avoid being greatly astonished, that the greatest authors, both modern and ancient, as well as the most sensible travellers, have joined in believing a circumstance so entirely false. In justice, however, to Dr. Shaw, we must except him from the number of these credulous travellers : "Of all the number of porcupines," says he, "which I have seen in Africa, I have never yet met with one which darts its quills, however strongly it was irritated. Their common method of defence is to lie on one side, and when

the enemy approaches very near, to rise suddenly, and wound him with the points of the other."

The porcupine, although a native of the hottest climates of Africa and India, lives and multiplies in colder countries, such as Persia, Spain, and Italy. Agricola says, that the species were not transported into Europe before the last century. They are found in Spain, but more commonly in Italy, especially on the Appenine mountains, and in the environs of Rome.

The porcupine, in its domestic state, is neither furious nor vicious; it is only anxious for its liberty; and, with the assistance of its fore teeth, which are sharp and strong, like those of the beaver, it easily cuts through a wooden prison. It is also known, that it feeds willingly on fruits, chestnuts, and crumbs of bread; that, in its wild state, it lives upon roots and wild grain; that, when it can enter a garden, it makes great havock, eating the herbs, roots, fruit, &c. It becomes fat, like most other animals, towards the end of summer; and its flesh, although insipid, is tolerable eating.

When the form, substance, and organization of the prickles of the porcupine are considered, they are found to be true quills, to which only feathers are wanting to make them exactly resemble those of birds. They strike together with a noise as the animal walks; and it easily erects them in the same manner as the peacock spreads the feathers of his tail.

THE COUANDO, OR BRAZILIAN PORCUPINE. The porcupine, as has been observed, is a native of the hot countries of the Old World; but, not having been found in the New, travellers have not hesitated to give its name to animals which seemed to resemble it, and particularly to that of which we are about to take notice. On the other hand, the Couando of America has been transported to the East Indies; and Pison, who probably was not acquainted with the porcupine, has engraved in Bontius the couando of America, under the name and description of the true porcupine. The couando, however, is not a porcupine, it being much less; its head and muzzle is shorter; it has no tuft on its head, nor slit in the upper lip; its quills are somewhat shorter, and much finer; its tail is long, and that of the porcupine is very short; it is carnivorous, rather than frugivorous, and endeavours to surprise birds, small animals, and poultry, while the porcupine

only feeds upon herbs, greens, fruits, &c. It sleeps all the day like the hedge-hog, and only stirs out in the night ; it climbs up trees, and hangs in the branches by its tail, which the porcupine cannot do. All travellers agree that its flesh is very good eating. It is easily tamed, and commonly lives in high places. These animals are found over all America, from Brazil and Guiana to Louisiana and the southern parts of Canada : while the porcupine is only to be found in the hottest parts of the Old Continent.

In transferring the name of porcupine to the couando, they have supposed and transmitted to him the same faculties, especially that of lancing its quills. Ray is the only person who has denied these circumstances, although they evidently appear at first view to be absurd.

THE URSON, OR CANADA PORCUPINE. This animal, placed by Nature in the desert part of North America, exists independent of, and far distant from, man. The *urson* might be called the *spiny beaver*, it being of the same size, the same country, and the same form of body ; it has, like that, two long, strong, and sharp incisive teeth at the end of each jaw ; its prickles are short, and almost covered with hair ; for the *urson*, like the beaver, has a double coat : the first consists of long and soft hair, and the second of a down, or felt, which is still softer or smoother. In the young *ursons*, the prickles are proportionably larger, more apparent, and the hair shorter and scarcer than in the adults.

This animal dislikes water, and is fearful of wetting himself. He makes his habitation under the roots of great hollow trees, sleeps very much, and chiefly feeds upon the bark of juniper. In winter the snow serves him for drink ; in summer he laps water like a dog. The savages eat his flesh, and strip the bristles off the hide, which they make use of instead of pins and needles.

THE TANREC, AND TENDRAC, OR ASIATIC HEDGE-HOGS, are two small animals of the East Indies, which a little resemble our hedge-hog, but are sufficiently different to constitute a different species. What strongly proves this is, their not rolling themselves up in the shape of a ball, like the hedge-hog ; and where the *tanrecs* are found, as at Madagascar, hedge-hogs are also found of the same species as ours.

There appear to be *tanrecs* of the two species, or per-



1. *Couvardo* ... 2. *Tanteo* ... 3. *Tendruu* ... *Alamuelopard*.

haps of two different breeds. The first, which is nearly as large as our hedge-hog, has its muzzle proportionably longer; and its ears are more apparent, and less furnished with prickles than those of the second, to which we have given the name of tendrac, to distinguish it from the first. The tendrac is not larger than a rat; its muzzle and its ears are shorter than those of the tanrec; which last is covered with shorter prickles, as numerous as those of the hedge-hog; whereas the tendrac has them only on the head, neck and shoulders, the rest of the body being covered with a coarse hair resembling the bristles of a hog.

These little animals, whose legs are small, move but slowly; they grunt like a hog, and wallow, like it, in mire; they are chiefly in creeks and harbours of salt water; they multiply in great numbers, and make themselves holes in the ground, and sleep for several months. During this torpid state their hair falls off, which is renewed upon their revival. They are usually very fat; and although their flesh be insipid, soft and spongy, yet the Indians find it to their taste, and consider it as a very great delicacy.

THE CAMELEOPARD is one of the tallest, most beautiful, and most harmless animals in nature. The enormous disproportion of its legs, (the fore legs being as long again as the hinder ones) is a great obstacle to the use of its strength; its motion is waddling and stiff; it can neither fly from its enemies in its free state, nor serve its master in a domestic one. The species is not very numerous, and have always been confined to the deserts of Ethiopia and some other provinces of Africa and India. As these countries were unknown to the Greeks, Aristotle makes no mention of this animal; but Pliny speaks of it, and Oppian describes it in a manner that is far from equivocal. "The cameleopard," says this author, "has some resemblance to the camel: its head and ears are small, its feet broad, and its legs long; but the height of the last is very unequal, the fore legs being much longer than the hinder, which are very short; so that, when the animal appears standing and at rest, it has somewhat the appearance of a dog sitting. There are two prominences upon the head, just between the ears: they resemble two small and straight horns. Its mouth is like the stag's; its teeth small and white; its eyes full of fire; its tail short, and furnished with black hair at its end."

"There is," says Strabo, "a large beast in Ethiopia, called *cameopardalis*; although it bears no resemblance to the panther, for its skin is not spotted in the same manner: the spots of the panther are obicular, and those of this animal are long, and nearly resembling those of the fawn, or young stag." Gillius's description seems still better: "I have seen," says he, "three cameleopards at Cairo. On their heads are two horns, six inches long; and, in the middle of their forehead, a tubercle rises to about the height of two inches, which appears like a third horn. This animal is sixteen feet high when he holds his head erect. Its neck alone is seven feet; and it is twenty feet long, from the tip of the nose to the end of the tail. Its fore and hind legs are nearly of an equal height; but the thighs before are so long in comparison to those behind, that its back seems to slope like the roof of a house. Its whole body is sprinkled with large brown spots, which are nearly of the same form. Its feet are cloven like those of the ox."

In inspecting the accounts travellers have given of the cameleopard, I find a tolerable agreement between them. They all agree, that it can reach with its head to the height of sixteen or seventeen feet, when standing erect; and that the fore legs are as high again as the hinder ones; so that it seems as if it were seated upon its crupper. They all likewise agree, that it cannot run very swift, on account of this disproportion; that it is very gentle, and that by this quality, and even by the shape of the body, it partakes more of the shape and nature of the camel than of any other animal; that it is among the number of ruminating animals, and, like them, is deficient of the incisive teeth in its upper jaw. By the testimonies of some, we find, that the cameleopard is to be met with in the southern parts of Africa, as well as in those of Asia.

It is very clear from what we have mentioned, that the cameleopard is a very different species from every other animal; but, if we referred it to any, it would be the camel, rather than the stag.

We are ignorant of the substance of the horns of the cameleopard; and in that part it may resemble the stag more than the ox, though possibly they may be neither solid, like those of the first, nor hollow like those of the ox, goat, &c. Who knows but they may be composed of united hairs, or of a substance and texture entirely peculiar to themselves. The horns of the cameleopard are surrounded with large,

coarse hair, and not covered with a down or velvet, like those of the stag. The tubercle in the middle of the head seems to form a third horn : the two others, which are not pointed, but have mossy knobs at their ends, are perhaps only tubercles somewhat resembling the former. Travellers inform us, that the female cameleopards have horns like the males, with this difference only, that they are smaller. If this animal, therefore, was really of the stag kind, the analogy would be violated here likewise ; for of all such animals there is only the female rein-deer that has horns.

THE LAMA, AND THE PACO. It is very singular, that, although the lama and the paco are domesticated in Peru, Mexico and Chili, as the horses are in Europe, or the camels in Arabia, we scarcely know any thing of them. Peru, according to Gregory de Bolivar, is the true and native country of the lamas ; they are conducted into other provinces, as New Spain, &c. but this is rather for curiosity than utility ; but in Peru, from Potosi to Curacas, these animals are in great numbers, and make the chief riches of the Indians and Spaniards, who rear them. Their flesh is excellent food ; their hair, or rather wool, may be spun into beautiful clothing ; and they are capable of carrying heavy loads in the most rugged and dangerous ways ; the strongest of them will travel with two hundred, or two hundred and fifty pounds weight on their backs : their pace is but slow, and their journey is seldom above fifteen miles a day ; but then they are sure, and descend precipices, and find footing among the most craggy rocks, where even men can scarcely accompany them ; they commonly travel for five days together, when they are obliged to rest, which they do of their own accord, for two or three days. They are chiefly employed in carrying the riches of the mines of Potosi. Bolivar affirms, that in his time above three hundred thousand of these animals were in actual employ.

The growth of the lama is very quick ; and its life is but of short duration. This animal couples so early as at three years of age, and remains strong and vigorous till twelve ; after which it begins to decline, and becomes entirely useless at fifteen. Their nature appears modelled on that of the Americans. They are gentle and phlegmatic, and do every thing with the greatest leisure and caution. When they stop on their journeys they bend their knees very cautiously, in order to lower their bodies without disordering their load.

As soon as they hear their driver whistle they rise up again with the same precaution, and proceed on their journey; they feed as they go along on the grass they meet with in their way, but never eat in the night, making use of that time to ruminate. The lama sleeps like the camel, with its feet folded under its belly, and ruminates in that posture. When overloaded or fatigued it falls on its belly, and will not rise, though its driver strikes it with his utmost force.

The lama is about four feet high; its body, comprehending the neck and head, is five or six feet long; its neck alone is near three feet. The head is small and well proportioned, the eyes large, the nose somewhat long, the lips thick, the upper divided, and the lower a little depending: it wants the incisive and canine teeth in the upper jaw. The ears are four inches long, and move with great agility. The tail is seldom above eight inches long, small, straight, and a little turned up at the end. It is cloven-footed, like the ox; but the hoof has a kind of spear-like appendage behind, which assists the animal to move and support itself over precipices and rugged ways. The back is clothed with a short wool, as is the crupper and tail; but it is very long on the belly and sides. These animals differ in colour; some are white, others black, but most of them brown.

These useful, and even necessary animals, are attended with no expense to their masters; for, as they are cloven-footed, they do not require to be shod, nor do they require to be housed, as their wool supplies them with a warm covering. Satisfied with a small portion of vegetables and grass, they want neither corn nor hay to subsist them; they are still more moderate in what they drink, as their mouths are continually moistened with saliva, which they have in a greater quantity than any other animal. The natives hunt the *huanacus*, or wild lama, for the sake of its fleece. The dogs have much trouble to follow them; and, if they do not come up with them before they gain the rocks, both the hunters and dogs are obliged to desist in their pursuit.

The pacos are a subordinate kind to the lamas, much in the same proportion as the ass is to the horse: they are smaller, and not so serviceable; but their fleece is more useful: their wool is fine and long, and is a sort of merchandise, as valuable as silk. The natural colour of the pacos is that of a dried rose-leaf, which is so fixed that it undergoes no alteration under the hands of the manufacturers. They not only make good gloves and stockings of this wool,

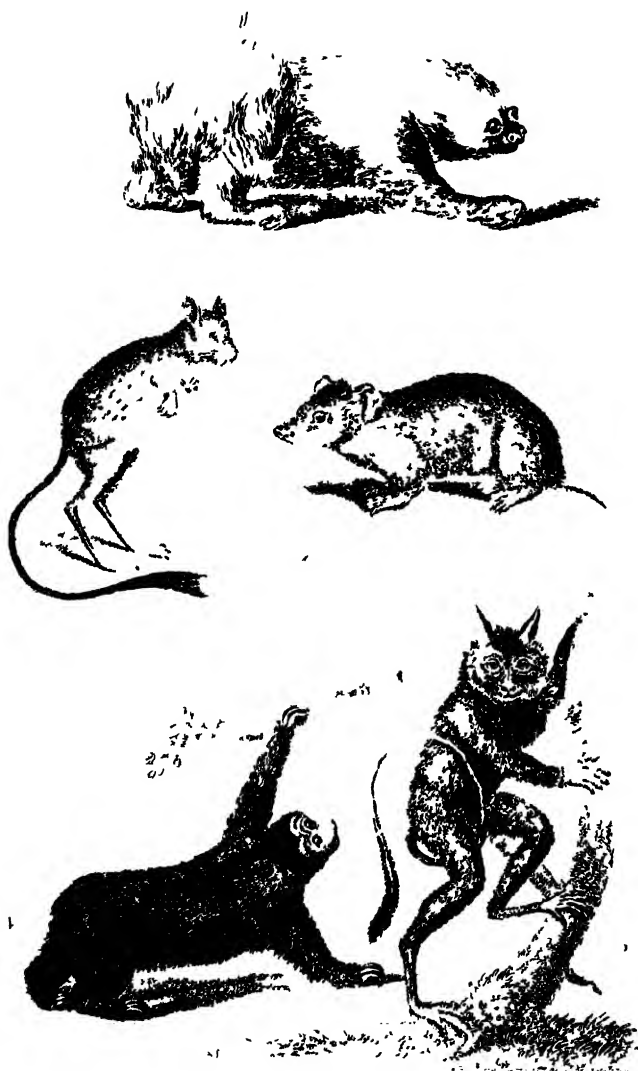
but also form it into quilts and carpets, which bring a higher price, and exceed those of the Levant.

The pacos also resemble the lamas in their form, excepting that their legs are shorter, and their muzzle thicker and closer. They inhabit and climb over the highest parts of the mountains. The snow and ice seem rather agreeable than inconvenient to them. When wild, they keep together in flocks, and run very swift; and, as soon as they perceive a stranger, they take flight, driving their young before them. The ancient monarchs of Peru rigorously prohibited the hunting of them, as they multiply but slowly; but since the arrival of the Spaniards in these parts, their number is greatly decreased, so that at present there are very few remaining. The flesh of these animals is not so good as that of the huanacus; and they are only sought after for their fleece, and the bezoar they produce. The method of taking them proves their extreme timidity, or rather their weakness. The hunters having driven the flock into a narrow passage, across which they have stretched a rope about four feet from the ground, with a number of pieces of linen or cloth hanging on it, the animals are so intimidated at these rags agitated by the wind, that they stop, and crowding together in a heap, the hunters kill great numbers of them with the greatest ease; but if there are any huanacus among the flock, which are less timid than the pacos, they leap over the rope with great agility. The example is immediately followed by the whole flock, and they escape the stratagem of their pursuers.

With respect to the domestic pacos, they are used to carry burdens, like the lamas; but being smaller and weaker, they carry much less weight. They are likewise of a more stubborn nature; and, when once they rest with their load, they will suffer themselves to be cut to pieces sooner than rise. The Indians have never made use of the milk of these animals, as they have scarcely enough to supply their own young. The great profit derived from their wool has induced the Spaniards to endeavour to naturalize them in Europe; they have transported them into Spain, in hopes to raise the breed in that country; but, the climate not agreeing with their nature, not one of them lived. We are, nevertheless, persuaded, that these animals which are more valuable than the lamas, might thrive upon our mountains, especially upon the Pyrenean. Those who brought them into Spain, did not consider that they could exist, even in Peru, only in the cold regions; that is, on

the top of the highest mountains ; that they are never to be found in the valleys, and die if brought into hot countries ; that consequently, in order to preserve them, they should be landed, not in Spain, but in Scotland, and even in Norway, and with greater certainty at the foot of the Pyrenean, Alpine, or other mountains, where they might climb and attain to the region that most agrees with their nature.

THE UNAN AND THE AI. These two animals have the epithet of *sloth* given to them both, by most authors, on account of their slowness, and the difficulty with which they walk. The unan has no tail, and only two nails on the fore feet. The ai has a short tail, and three nails on every foot. The nose of the unan is likewise much longer, the forehead higher, and the ears longer than the ai. It differs also in the hair. As for the internal parts, its viscera are both formed and situated different ; but the most distinctive, and, at the same time, the most singular character, is, that the unan has forty-six ribs, while the ai has but twenty-eight. This alone supposes two species, quite distinct one from the other ; and these forty-six ribs, in an animal whose body is so short, is a kind of excess or error in nature ; for, even in the largest animals, and those whose bodies are relatively longer than they are thick, not one of them is found to have so many. The elephant has only forty, the dog twenty-six, and the human species twenty-four, &c. This difference in the construction of the unan and the ai supposes a greater distance between these two kinds than there is between that of the cat and the dog, which have the same number of ribs ; for the external differences are nothing in comparison with the internal ones, which are the causes of the others. These animals have neither incisive nor canine teeth ; their eyes are dull and heavy ; their mouths wide and thick ; their fur coarse and staring, and like dried grass ; their thighs seem almost disjointed from the haunch ; their legs very short, and badly shaped ; they have no soles to the feet, nor toes separately moveable, but only two or three claws excessively long, and crooked downwards and backwards. Unfurnished with teeth, they cannot seize any prey, nor feed upon flesh, nor even upon vegetable food. Reduced to live on leaves and wild fruits, they take up a long time in crawling to a tree, and are still longer in climbing up to the branches. During this slow and painful labour, which sometimes lasts many days, they are obliged to support the most pressing



1. Man — 2. Loris — 3. Howler — 4. or. Voth — 5. Loris

hunger; and when, at length, one of them has accomplished its end, it fastens itself to the tree, crawls from branch to branch, and, by degrees, strips the whole tree of its foliage. In this manner, it remains several weeks without moistening its dry food with any liquid; and when it has consumed the store, and the tree is entirely naked, yet unable to descend, it continues on it till hunger presses, and that becoming more powerful than the fear of danger or death, it drops, like a shapeless, heavy mass, to the ground, without being capable of exerting any effort to break the violence of its fall.

On the ground, these animals are exposed to all their enemies; and their flesh is not absolutely bad, they are killed by men and beasts of prey. They seem to multiply but little, or, if they produce very often, it is only a small number, as they are furnished but with two teats. Every thing concurs, therefore, to their destruction, and the species supports itself with great difficulty. It is true, that, although they are slow, heavy, and almost incapable of motion, yet they are hardy, strong, and can abstain a long time from food; covered also with a thick and coarse fur, and unable scarcely to move, they waste but little, and fatten by rest, however poor and dry their food is. Although they have neither horns on their heads, nor hoofs to their feet, nor incisive teeth in the lower jaw, they are, notwithstanding, among the number of ruminating animals, and have, like them, four stomachs; so that they, consequently, can compensate for the quality of their food by the quantity they take at a time; and what is still more singular is, that, instead of having, like other ruminating animals, very long intestines, theirs are very short, like those of the carnivorous kind.

Both these animals belong to the southern parts of the New Continent, and are never to be met with in the Old. The unan, as well as the ai, is to be met with in the deserts of America, from Brazil to Mexico; but they have never inhabited the northern countries. They cannot endure cold nor rain; the change from wet to dry spoils their fur, which then resembles badly-dressed hemp, rather than wool or hair.

THE SURIKAT. This animal is a native of Surinam, and the other provinces of South America. It is very lively and subtle; it sometimes walks on its hinder legs, and often sits upright on them, with its fore paws hanging

down by the side of the body. Its head is then erect, and moves upon the neck as on a pivot. It is not so large as a rabbit, and nearly resembles the marmouse in size; its tail is somewhat longer, and its snout is more prominent and raised. It is more like the coati than any other animal. its character likewise is nearly original, since it neither belongs to the coati, nor the hyæna. These two are the only animals who have four toes to every foot.

This animal eats raw meat with eagerness, and particularly poultry. It is fond of fish, and still more of eggs. It will eat neither fruit nor bread. It makes use of its fore feet, like the squirrel, to carry its food to its mouth; it laps its drink like a dog, and will not touch water, unless it is luke-warm. Of one in the French king's collection, its common drink was its own urine, although of a very strong smell. It did not chew its food, but often scratched the brick or plaistered walls with its nails. It was so well tamed, that it answered to its name, when called; it went about the house like a cat, and had two voices; one like the barking of a young dog, when it was left long alone, or heard an unusual noise; on the contrary, when it was caressed. or when it shewed some token of pleasure, it made a noise as strong as that of a rattle briskly turned. It was a female animal, and only lived one winter, notwithstanding all the care that was taken to feed and keep it warm.

THE TARSIER is an animal remarkable for the length of its hind legs. The bones of the feet, and especially those which compose the upper part of the tarsus, are of an extraordinary size; and it is from this very character we have taken its name. It has five toes to every foot; it has, as I may say, four hands; for the toes are very long, and sufficiently divided: the largest of those behind, or the thumb, is terminated by a flat claw; and, although the claws of the other toes, are pointed, they are, at the same time, so short and so small, that they do not prevent the animal from using its fore feet like hands. The jerboa, on the contrary, has only four toes, and four long and crooked claws, on its fore feet: and, instead of a thumb, it has only a tubercle without any claw: but, what removes it farther from our tarsier, is, that it has only three fingers, or three great claws, in the hind feet. The tarsier is found in some remote islands of India. In Amboyna particularly.

THE PHALANGER. These animals, which have been

sent to us by the name of *Surinam rats*, have much less affinity with rats than with the animals of the same climate of which we have given the history, under the names of the *marmouse*, and *cayopoline*. As it has never been named by any artist or traveller, we have denominated it from its character, which is totally different from that of any other animal, and have called it *phalanger* from its *phalanges* being singularly formed, and because its two fore toes are conjoined in such a manner, that this double toe appears like a hoof, separated only near the claws; the thumb is separated from the fingers, and has no claw at its extremity.

These animals vary in the colour of the hair; they are about the size of a small rabbit, or a very large rat, and are remarkable for the excessive length of their tail, snout, and the form of their teeth, which alone is sufficient to distinguish the phalanger from the marmouse, the surikat, the rat, and every other species of animals to which it may be supposed to relate.

THE COQUALLIN. This animal was sent from America, by the name of the *orange-coloured squirrel*.* It is, however, not a squirrel, although sufficiently resembling it by the shape of the tail; for it only differs by many external characters, but also by its nature and manners.

The coquallin is much larger than the squirrel; it is a beautiful animal, and very remarkable for its colour, its belly being of a fine yellow, and its head, as well as body, varied with white, black, brown, and orange; it covers its back with its tail, like the squirrel, but has not, like that animal, small brushes of hair at the tips of the ears: it never climbs up any trees, and dwells in the hollows and under the roots of trees, like the garden squirrel. In such places it builds its nest, and rears up its young; it likewise stores its little habitation with corn and fruit, to feed on during the winter; it is a jealous and cunning animal, and so exceedingly wild that it is impossible to be tamed.

The coquallin is only found in the southern parts of America; the white and orange-coloured squirrels of the East Indies are much smaller, and their colours uniform. These are true squirrels, which climb up trees, and produce their young on them; while the coquallin, and the American *suisse*, burrow under ground, like rabbits, and have no other affinity with the squirrel than a resemblance in the external form.

THE HAMSTER, OR GERMAN MARMOT, is one of the most famous, and most pernicious rats that exist. We have fed one of these animals for many months, and afterwards had it dissected, and observed, that the hamster resembled more the water-rat, than any other animal; it resembled it also in the smallness of its eyes, and the fineness of its hair; but its tail is not so long as that of a water-rat; but, on the contrary, it is much shorter than that of the short-tailed mouse. All these animals live under the earth, and seem to be animated with the same instinct; they have nearly the same habits, and particularly that of collecting corn, &c. and making great magazines in their holes.

The habitations of the hamsters are different, according to their sex and age, and also to the quality of the land they inhabit. That of the male hamster is an oblique passage, and at the entrance is a portion of earth thrown up. At a distance from the entrance there is a single hole, which descends in a perpendicular manner to the chambers or cavities of the habitation. There is no hillock of earth near that hole; which makes us presume, that the oblique entrance is made hollow from the outside, and that the perpendicular hole, by which they come out, is worked withinside, from the bottom to the top.

The habitation of the female has also an oblique passage, with two or three, and even eight perpendicular holes, by which the young ones may come in and go out. The male and the female have each their separate abode: that of the female is deeper than that of the male.

The perpendicular hole is the common passage for coming in and going out. By the oblique road, they throw out the earth they scratch up. This passage also has a gentle declivity into some of the cavities, and another more steep into others which serve for a free circulation of the air in this subterraneous habitation. The cavity, where the female breeds her young, contains no provision, but only a nest formed of straw or grass. The depth of the cavity is very different. The young hamster, of a year old, makes its burrow only a foot deep, while the old animal often hollows it to the depth of four or five feet. All the cavities communicate together in one habitation, which is about eight or ten feet in diameter.

These animals store their magazines with dry clover, corn, and other grain; beans and pease they likewise provide

themselves with ; all these they are particularly careful to separate from the husk, which, with every other matter they do not make use of, they carry out of their habitation by their oblique passage.

The hamster commonly gets in its winter provisions at the latter end of August. When it has filled its magazines it covers them over, and shuts the avenues to them carefully with earth. This precaution renders the discovery of these animals very difficult. The heaps of earth, which they throw up before the oblique passage, are the only marks to trace their habitations. The most usual method of taking them is by digging them out of their holes, which is attended with much trouble, on account of the depth and extent of their burrows ; however, a man versed in this business commonly effects his purpose with good success. In autumn, he seldom fails of finding two good bushels of corn in each of their habitations ; and he draws great profit from the skins of the animals. The hamsters bring forth their young two or three times in a year, and seldom less than five or six each time. Some years there are great numbers of them to be seen, and in others, scarcely any to be met with. They multiply in great numbers when the seasons are wet, which causes a great scarcity of grain, by the devastation these animals make.

The hamster begins to burrow at the age of six weeks, or two months ; it never copulates, however, in the first year of its growth.

The polecat is a great enemy to the hamsters, which he destroys in a great number ; he not only pursues them on land, but follows them into their burrows, and feeds on them there.

The back of the hamster is commonly brown, and the belly black ; however, there are some of a grey colour ; and this difference may proceed from their age. Besides these, there are some often met with which are entirely black.

The hamsters destroy each other, like field-mice ; two of them being put into the same cage, the female strangled the male in the night-time ; and, having divided the muscles that held the jaws, she devoured great part of its viscera. There are numbers produced in one year, inso-much that, in some parts of Germany, a reward is fixed on their heads. They are likewise in such great numbers, that their fur is sold exceedingly cheap.

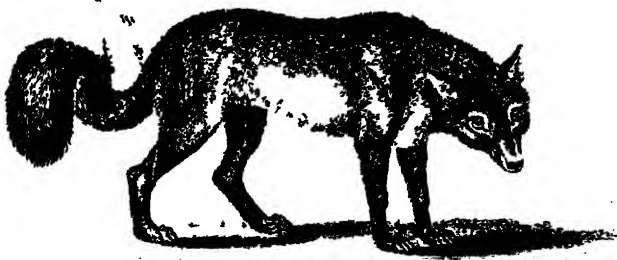
THE BOBAK, AND OTHER MARMOTS. The name of the *Strasbourg marmot* has been affixed to the hamster, and that of the *Poland marmot* to the bobak: but it is certain that the hamster is not a marmot; and it is also probable that the bobak is one, as it only differs from the marmot of the Alps by the colour of its fur, which is not quite so grey. There is a great claw, or toe, to the fore-feet of the hamster, while the marmot has only four toes to each foot; but in other respects it perfectly resembles it. It is the same with respect to the Canadian marmot, or monax, which some travellers have termed the *whistler*. It only seems to differ from the marmot by the tail, which is thicker of hair.

The Canadian monax, the Poland bobak, and the Alpine marmots are, indeed, probably all the same kind of animal under different denominations. As this species prefers the coldest and highest mountains in Poland, Russia, and other parts of the north of Europe, no wonder it is found in Canada, where it is only somewhat less than in Europe.

The Siberian animal also, called by the Russians *Jevras Chka*, is a kind of marmot, still less than the Canadian monax.

JERBOA is a generical name, which we make use of in this place, to denote those remarkable animals whose legs are extremely disproportionate; those before being not above an inch long, and the others about two inches one-fourth, exactly resembling those of a bird. There are four distinct species, or varieties of this kind. First, the *Tarsier*, of which we have already spoken, and which is certainly a particular species, as its toes are made like those of a monkey, having five on each foot. Secondly, the *Jerboa*, whose feet are like the *fissipedes*, with four claws on those before, and three on those behind. Thirdly, the *Alagtata*, whose feet are formed like those of the jerboa, with this difference, that they have five toes on the fore, and three on the hinder feet, with a spur or a kind of thumb, or a fourth toe, much shorter than the other. Fourthly, the *Daman Israel*, or *Lamb of Israel*, which has four toes to the fore-feet, and five to the hinder, which may possibly be the same animal which Linnæus has described by the name of *Mus Longipes*.

The head of the jerboa is sloped somewhat in the man-



1. Ichneumon — 2. Fuchsal — 3. Lutris — 4. Glutton

ner of a rabbit; but the eyes are larger, and the ears shorter, though elevated and open, with respect to its size; its nose and hair are of a flesh colour, its mouth short and thick, the orifice of the mouth very narrow, the upper jaw very full, the lower narrow and short, the teeth like those of the rabbit; the mustachos are composed of long black and white hairs; the fore-feet are very short, and never touch the ground; they are furnished with four claws, which are only used as hands to carry the food to the animal's mouth; the hind feet have but three claws, the middle one longer than the other two; the tail is three times as large as its body, and is covered with short stubborn hair, of the same colour as that on the back, but tufted at the end with longer and softer hair; the legs, nose, and eyes are bare, and of a flesh colour; the upper part of the head and back are covered with an ash-coloured hair; the sides, throat, and belly are whitish; and below the loins, and near the tail, there is a large, black, transversal band, in form of a crescent.

These little animals commonly conceal their hands, or fore-feet, with their hair; so that they are said by some to have only hinder-feet. When they move from one place to another they do not walk, that is, advance one foot before the other, but jump, or bound, about four or five feet at a time: this they do with the greatest ease and swiftness, holding themselves erect, after the manner of birds when they hop on the ground. They rest themselves in a kneeling posture, and only sleep in the day. In the night-time they seek for their food like hares, and, like them, feed on grass, corn, and other grain. They are of a gentle nature, but not to be tamed beyond a certain limit. They burrow like rabbits, and in much less time. They lay up store of grass, about the latter end of summer, in their habitations, and, in cold countries, remain in them during the winter. They are found in Syria, Phœnicia, Barbary, &c.

THE ICHNEUMON. This animal is domestic in Egypt, like our cat; and, like that, is serviceable in destroying rats and mice: but its inclination for prey, and its instinct, is much stronger, and more extensive than the cats; for it hunts alike, birds, quadrupeds, serpents, lizards, and insects; it attacks every living creature in general, and feeds entirely on animal flesh; its courage is equal to the

sharpness of its appetite ; it is neither frightened at the anger of the dog, nor the malice of the cat, nor even dreads the bite of the serpent : it pursues them with eagerness, seizes on them, however venomous they may be. As soon as it begins to feel the impressions of their venom, it immediately goes in search of antidotes, and particularly a root that the Indians call by its name, and which, they say, is one of the most powerful remedies in nature against the bite of the viper. It sucks the eggs of the crocodile, as well as those of fowls and birds ; it also kills and feeds on young crocodiles, when they are scarcely come out of their shell ; and, as fable commonly accompanies truth, it has been currently reported that, by virtue of this antipathy, the ichneumon enters the body of the crocodile when it is asleep, and never quits it till he has devoured its entrails.

Naturalists have supposed many kinds of ichneumons, because there are some larger than others, and of a different coloured hair ; but if we consider that, being frequently reared in houses, they have, like other domestic animals, undergone varieties, we shall readily perceive that this diversity of colour, and this difference of size, only indicates simple varieties, not sufficient to constitute a separate species. It also appears that the ichneumons in Egypt, which may be said to be domestic, are longer than those in India, which are in a wild state.

The ichneumon lives very willingly by the sides of rivers, inundations, and other waters. It quits its habitation to seek its prey near habitable places. It sometimes carries its head erect, foreshortens its body, and raises itself upon its hind-legs ; at other times it creeps and lengthens itself like a serpent : it often sits upon its hind-feet, and often springs upon its prey ; its eyes are lively, and full of fire ; its aspect is beautiful, the body very active, the legs short, the tail thick and very long, and the hair rough and bristly. Both male and female have a remarkable orifice, independent of the natural passages. It is a kind of pocket, into which an odoriferous liquor filters. They pretend, that it opens this bag, or pocket, to refresh itself when too hot. Its nose is very sharp, and its mouth narrow, which prevents it from seizing and biting any thing very large ; but this defect is amply supplied by its agility, courage, and by its power : it very easily strangles a cat, although much larger and stronger than itself ; it

often fights with dogs; and, of whatever size they are, it commonly gets the better of them.

THE FOSSAN is called by some travellers, the *Genet of Madagascar*; but it is, in general, much smaller than the genet; and what proves it not to be of that kind is, that it has no odoriferous bag, the essential attribute belonging to that animal. Its manners are much like those of our pole-cat; and, when the male fossan is in heat, it emits a very strong smell like musk. It eats both flesh and fruit, but prefers the last. It is a very wild animal, and very difficult to be tamed. The eye of the fossan represents a black globe, very large in comparison with the size of its head, which gives this animal a mischievous look.

The animal called *Berba* in Guinea, seems to be the same as the fossan, consequently this species exists in Africa, as well as in Asia.

THE VANSIRE. Those who have spoken of this animal have taken it for the ferret, which indeed it resembles in many respects, though it differs from it by characters strong enough to make it a distinct species. The vansire has twelve teeth, or grinders, in its upper jaw, while the ferret has only eight. The vansire also differs in the colour of its hair, from all ferrets; although, like every other animal which man is careful of rearing and increasing, those creatures vary much, both male and female.

The animal called by some the *Weasel of Java*, and by others the *Ferret of Java*, may possibly be the same as the vansire.

THE MAKI. This name of Maki has been given to many different kinds of animals. The first class is the mocock, or maucaucau; the second is the mongooz, commonly called the *brown maki*; and the third kind is the vari, called by some the *pied maki*.

The *maucaucau* is a beautiful animal, remarkable for the largeness of its eyes, and the length of the hinder legs, which by far exceed those before; by its beautiful and long tail, which is continually elevated and in motion, and upon which are upwards of thirty rings, alternately black and white, all very distinct and separate one from the other. It is gentle; and, although it greatly resembles the monkey in many particulars, it is not so malicious in

its nature. It is a gregarious animal, commonly found in company in its natural state; in Madagascar, thirty or forty are seen herding together. It sleeps in a sitting posture, with its snout resting upon its breast; its body is no thicker than that of a cat; but is longer; and it appears larger, as the legs of the animal are very long. The hair is soft, and stands upright.

The *mongooz* is less than the *maucaucau*; but its hair is, like that, of a short and silken nature; but a little curled; the nose is also thicker, and much resembling that of the *vari*. We had a *mongooz* in our possession for several years; its coat was of a brown colour, the eyes yellow, the nose black, and the ears short. It had a custom of playing with and biting its tail, and had, by this method, lessened it by four or five of the last vertebræ. Whenever it got loose, it visited the shops in the neighbourhood, and would make free with fruit, sugar, sweet-meats, &c. to obtain which it would open the boxes. At such times, it was difficult to retake him; and it would bite those that attempted it, even its keeper.

The *vari* is much larger, stronger, and wilder than the *maucaucau*, and is even exceedingly savage and mischievous in its free state. Travellers tell us, that these animals are as furious as tigers, and very difficult to be tamed; and that its voice is so very loud, that, when there are only two together in the woods, it might be imagined that the noise they made proceeded from an hundred. Its hair, in general, is much longer than that of the *maucaucau*; and it has a kind of ruff round the neck, consisting of very long hair. In other respects, its hair is black and white, and, although very long, stands nearly upright; its snout is thicker and longer than that of the *maucaucau*; its ears much shorter, and edged with long hair; and its eyes are of so deep an orange colour, that, if not minutely inspected, they appear to be red.

The *maucaucau*, the *mongooz*, and the *vari*, are all of the same country. They seem to be confined to Madagascar, Mozambia, and the neighbouring lands of these islands.

THE *LORI* is a little animal, found in Ceylon, very remarkable for the singularity of its conformation. It is, perhaps, of all animals, the longest in proportion to its size, having nine vertebræ in the loins; whereas other quadrupeds have only five, six, or seven. The body

appears the longer for having no tail. In other respects, it resembles those of the *maki* kind, as well in the hands and feet, as in the quality of the hair, the number of teeth, and the sharpness of its snout. This animal seems to be the same as that which Thevenot speaks of in the following terms:—"I saw," says he, "a monkey at Mogul, which had been brought thither from Ceylon. It was greatly valued on account of its size, being not bigger than a man's fist. It is a different kind from the common monkey, having a flat forehead, eyes round and large, and of a bright yellow colour, like those of some cats; its snout is very pointed; the inside of the ears is yellow; and it had no tail. When I examined it, it sat erect on its hind feet, folded the others across its breast, and looked around at the spectators, without the smallest fear."

THE JAVELIN BAT. The animal in question we have denominated the *javelin bat*, from a sort of comb, or membrane, on its nose, which perfectly resembles the head of a lance. Although this character alone is nearly sufficient to distinguish it from all other animals, yet we can add some others, as its having scarcely any tail, and its hair and size being nearly like the common bat, with this difference, that instead of having six incisive teeth in the lower jaw, it has only four. This kind of bat is very common in America, and never found in Europe.

There is another bat in Senegal, which has also a membrane upon its nose, not in the form of a horse-shoe, as in one species we have observed, or the head of a javelin, as in this, but in the shape of an oval leaf. These three bats, being of different climates, are not simple varieties, but distinct and separate species.

Bats, which have, in other respects, great affinity with birds by their power of flying, and by the strength of the pectoral muscles, seem to resemble them still more in these membranes, or combs, which they have on their face; for most birds have also combs, or membranes, about their beak or head, which seem, in every respect, as superfluous as those of the bat kind.

CHAP. XX.

Of the Serval—The Ocelot—The Margay—The Jackal, and the Adil—The Isatis—The Glutton—The Stinking Pole-cats—The Pekan, and the Vison—The Sable—The Leming—The Canadian Otter—The Seal—The Sea Lion—The Walrus, or Morse—The Seabear—The Monati.

THE SERVAL.

THIS animal has been kept alive several years in the royal menagerie of France, by the name of the *tiger-cat*; and we should have still remained ignorant of its true name, if M. de Montmirail had not discovered it in the account of an Italian voyage, which he had translated:—"The *maraputia*, which the Portuguese in India call *serval*," says Vincent Maria, "is a wild and ferocious animal, much larger than the wild cat, and something less than the civet, which it differs from by its head being rounder and thicker in proportion to its body, and its face sinking in about the middle of it. It resembles the panther in the colour of the hair, which is brown upon the head, back, and sides, and white upon the belly; also in the spots, which are distinct, equally distributed, and less than those of the panther; its eyes are brilliant; its whiskers are composed of long and stiff bristles; its tail is short; its feet large, and armed with long and hooked claws. It lives among the mountains of India, and is very seldom seen on the ground; it remains almost continually upon high trees, where it catches birds, on which it feeds. It leaps also as nimbly as a monkey, and goes from one tree to another with such great address and agility, that it passes over a great space in a short time, and, we may say, only appears and disappears. It is ferocious in its nature, but flies at the sight of man."

Neither captivity, nor good or bad treatment, will tame or soften the ferocity of this animal. It seems to be the same creature as the tiger-cat of Senegal and the Cape of Good Hope, which, according to the testimony of travellers, resembles our cat in its shape and size. "This animal," they say, "is four times as large as a cat,

of a voracious nature, and feeds like the monkey, the rat," &c.

THE OCELOT is a ferocious and carnivorous animal, which must be placed next the jaguar, or the conguar; for it is very near the size, and resembles them in its nature and figure. A male and female ocelot were shewn at the fair of St. Ovid, in September, 1764. They came from the countries adjoining to Carthagera, and had been taken from their mother in the month of October, 1763; they became so strong and cruel at three months old, as to devour the bitch which had nursed them. When we saw them they were about a year old, and about two feet long. They had then, probably, only attained one half or two thirds of their growth. These animals were shewn by the name of the *tiger-cat*; but we have rejected this denomination as precarious and confused, especially as the jaguar, serval, and the margay, have been sent to us with the same name; those three animals are very different from each other, and from the animal we are at present treating of.

When the ocelot has arrived at its full growth, it is two feet and a half high, and about four feet long; the tail does not touch the ground when it is hanging down, and consequently is not two feet long. This animal is very voracious, but at the same time timid; he very seldom attacks the human species, and is terrified at the sight of a dog. When it is pursued it flies to the forests, and climbs up a tree to save itself, where it sleeps and watches for its prey, on which it springs when within its command; it prefers blood to flesh, and this is the reason why it destroys such a number of animals; for, instead of satisfying its hunger by devouring them, it only quenches its thirst by sucking their blood.

In its captive state, it preserves its ferocious nature; nothing can tame it nor calm its restless motion, which obliges its keeper to confine it constantly in a cage.

THE MARGAY is much smaller than the ocelot. It resembles the wild cat in the size and shape of its body; its head only is more square, its snout longer, its ears rounder, and its tail longer; its hair also is shorter, and it has black streaks and spots on a brown ground. It was sent us from Cayen, by the name of the *tiger-cat*; and, in fact, it partakes of the nature of the cat and the jaguar, or the

ocelot, which are the two animals to which the name of tiger has been affixed in the New Continent. According to Fernandes, when this animal has arrived at its full growth, it is not quite so large as the civet; and, according to Marcgrave, whose comparison is juster, it is about the size of a wild cat, which it also resembles in its natural habits, living only upon fowls, and other small game; but it is very difficult to be tamed, and never loses its natural ferocity; it varies greatly in its colour, though commonly it is such as we have here described it. This animal is very common in Brasil, and in all the other provinces of South America.

THE JACKAL, AND THE ADIL. We are not certain that these two names denote two animals of different species. We only know that the jackal is a larger animal, which is more ferocious, and difficult to be tamed, than the adil. By the writings of travellers, it appears, that there are both great and small jackals, as well in America, as in Silesia, Russia, and in every part of Asia, which we call the Levant, where this species is very numerous, very troublesome, and very hurtful. These animals are generally about the size of our foxes; but their legs are shorter; and they are remarkable for the colour of their hair, which is of a glossy and bright yellow. This is the reason why many authors have called the jackal the *golden wolf*. As both the jackal and the adil, however, are natives of the same countries; as the species has not been altered by a long domesticity, and as there is a considerable difference in the size, and even in the nature of these animals, we shall look on them as two distinct species, with the reserve of uniting them, when we shall have occasion to prove that they cohabit and copulate together.

As the species of the wolf approaches that of the dog, so the jackal finds a place between them both. The *jackal*, or *adil*, as Belen says, is a *beast between the wolf and the dog*. To the ferocity of the wolf it joins, in fact, a little of the familiarity of the dog. Its voice is a kind of a howl, mixed with barking and groaning; it is more noisy than the dog, and more voracious than the wolf; it never stirs out alone, but always in packs of twenty, thirty, or forty; they collect together every day, to go in search of their prey; they make themselves formidable to the most powerful animals, by their number; they attack every kind of beasts or birds, almost in the presence of the human species; they abruptly

enter stables, sheepfolds, and other places, without any sign of fear; and when they cannot meet with any other thing they will devour boots, shoes, harnesses, &c. and what leather they have not time to consume, they take away with them. When they cannot meet with any live prey, they dig up the dead carcases of men and animals. The natives are obliged to cover the graves of the dead with large thorns, and other things, to prevent them from scratching and digging up the dead bodies. The dead are buried very deep in the earth; for it is not a little trouble that discourages them. Numbers of them work together, and accompany their labour with a doleful cry; and, when they are once accustomed to feed on dead bodies, they run from country to country, follow armies, and keep close to the caravans. This animal may be styled the crow of quadrupeds; for they will eat the most putrid or infectious flesh: their appetite is so constant, and so vehement, that the driest leather is savory to them; and skin, flesh, fat, excrement, or the most putrefied animal, is alike to their taste.

THE ISATIS is very commonly seen in the northern countries, and but rarely found on this side sixty-nine degrees latitude: it is nearly two feet in length; it perfectly resembles the fox in the form of its body and the length of the tail; but its head is like that of a dog: its hair is softer than that of the common fox; its head is short in proportion to its body; it is broad towards the neck, and terminates in a sharp-pointed snout. Its ears are almost round. There are five toes and five claws to the fore feet, and only four toes and four claws to the hinder ones. The hair on every part of the body is about the length of two inches, smooth and soft as wool.

The voice of the isatis partakes of the barking of the dog, and the yelping of the fox. Those who deal in furs distinguish two animals of this kind, the one white, and the other ash-coloured: the last are the most valuable.

The isatis lives upon rats, hares, and birds, which it catches with as much subtilty as the fox. It plunges in the water, and traverses the lakes, in search of water-fowls and their eggs. The only enemy it has in the desert and cold countries, which it inhabits, is the glutton.

THE GLUTTON. The body of the glutton is thick, and its legs short. It is nearly of the size of a ram, but

as thick again ; its head is short, its eyes small, its teeth very strong, its tail rather short, and, covered with hairs to its extremity ; it is black along the back, and of a reddish brown on the flanks ; its fur is exceedingly beautiful, and much valued. It is common in Lapland, and all the neighbouring countries of the Northern Sea, as well in Europe as in Asia. It is called *Carcajou* in Canada, and the northernmost parts of America. The animal indicated by Fernandes, by the name of the *Mountain Dog*, is probably of the glutton species, which possibly is dispersed as far as the desert mountains of New Spain.

The legs of the glutton are not formed for running ; its pace is very slow ; but its cunning supplies this deficiency ; it waits the arrival of its prey in ambush ; and, in order to seize it with greater security, it climbs up a tree, from which it darts down on the elk and the rein deer, and fastens itself so strongly with its claws and teeth, that all the efforts of the animal cannot remove it. The poor animal in vain flies with its utmost speed ; in vain it rubs itself against trees, and other objects ; all is useless : fastened on its back or loins, the glutton still persists in tormenting it by digging into its flesh, and sucking its blood, till the animal, fainting with loss of blood, falls ; then the glutton devours it by peacemeal, with the utmost avidity and obstinate cruelty. It is inconceivable, what a length of time together the glutton will eat, and what a quantity of flesh it will devour at one single meal.

From this quality, the glutton has obtained the name of the *Quadruped Vulture*. It is more insatiable, and commits greater depredations, than the wolf ; it would destroy every animal, if it had sufficient agility ; but the only animal it is capable of taking on foot is the beaver, which it easily destroys : it even often attacks that animal in its hole, and devours both it and its young, if they do not get to the water in time ; for then the beaver escapes its enemy by swimming, and the glutton stops its pursuit to feed upon the fish. When it is deprived of any living food, it goes in search of carcases, scratches open graves, and devours the flesh of dead bodies to the very bone.

Although this animal is subtle, and uses every art to conquer other animals, it seems to have not the least instinct for its own preservation. It suffers the human species to approach it without the least appearance of fear. This indifference, which seems to shew its imbecility, is occa-

sioned, perhaps, by a different cause; it is certain that the glutton is not a stupid animal, since it readily finds means to satisfy its perpetual and almost immediate appetite; it does not want for courage, since it attacks every animal indifferently that comes in its way, and does not fly at the sight of man, nor even shew the least mark of spontaneous fear. If, therefore, it is deficient in a proper care for its own safety, it does not arise from an indifference for its preservation, but only from its habit of security, as it is a native of almost every desert country, where it seldom meets with any of the human species.

As the isatis is not so strong, but much swifter than the glutton, it serves the latter as a purveyor, following it in its pursuit of animals, and often depriving it of its prey, before it has devoured it, or, at least partaking of it; for the moment the glutton approaches, the isatis, to avoid destruction itself, leaves what remains for the glutton to feed on. Both these animals burrow in the ground; but in every other habit they are different. The isatis often goes in flocks, while the glutton moves alone, or sometimes with its female: they are often found together in their burrows. The fiercest dogs are fearful of attacking the glutton, which defends itself with its teeth and feet, and often mortally wounds them.

The flesh of the glutton, like that of every other voracious animal, is very bad food. It is only hunted after for its skin, which makes an exceedingly good and beautiful fur, not inferior to the sable and black fox. It is only said that, when properly chosen and well dressed, it has a more excellent gloss than any other skin, and even has the beauty of a rich damask.

THE STINKING POLECATS are found in every part of South America. They may be divided into four species; the *squash*, the *conepale*, the *skink*, and the *zorille*.

The first of these animals is about sixteen inches long; its legs are short, its snout pointed, its ears small, its hair of a deep brown, and its claws black and sharp. It chiefly dwells in the hollow clefts of rocks, where it brings forth its young. It preys upon small animals, birds, &c. and when it can steal into a farm yard, it kills the poultry, but eats only their brains. When it is pursued or offended, it calls up all its diabolical scents to its defence, and sends forth such a horrid stench, that it is dangerous for men or dogs to approach it. Its urine is apparently infected with

this nauseous vapour, which, however, we must observe, does not seem habitual to it.

Among the four kinds of stinkards we have above indicated, the two last belong to the hottest countries of South America, and may possibly be no more than two varieties, and not two different species. The two first are varieties of New Spain, Louisiana, Carolina, and other temperate climates, and seem to be two distinct and different species from the others; but particularly the squash, which has a particular character, of having only four claws on the fore feet, whereas all the rest have five; but, in every other respect, these animals have nearly the same figure, the same instinct, the same offensive scent, and only differ, as I may say, by the colour and length of the hair. The squash, as has been observed, is of a pretty uniform brown colour, and its tail is not tufted like the rest. The coneate has five white stripes on a black ground, running longitudinally from the head to the tail. The skink is white on the back, and black on the side, but quite black on the head, excepting a white streak, which runs from the nape of the neck to the forehead. Its tail is tufted, and clothed with very long white hairs, mixed with some of a black colour.

The zorille, which is also called mauripita, is still smaller, and has a most beautiful tail, furnished with as great abundance of hair as the skink, from which it differs by the disposition of the spots on its coat, the white streaks running longitudinally from the head to the middle of the back, on a black ground; besides which, there are other kinds of streaks, which pass transversely over the loins, the crupper, and the insertion of the tail, one half of which is black and the other white, whereas in the skink they are all of the same colour.

Kalm, speaking of this animal, says, "one of them came near the farm where I lived. It was in winter time, and during the night, and the dogs that were upon the watch pursued it for some time, until it discharged its urine against them. Although I was in my bed a good way off, I thought I should have been suffocated, and the cows and oxen themselves, by their lowings, shewed how much they were affected by the stench. About the end of the same year, another of those animals crept into our cellar, but did not exhale the smallest scent, because it was not disturbed. A foolish woman, however, who perceived it at night, by the shining of its eyes, killed it,



and at that moment its stench began to spread. The whole cellar was filled with it to such a degree, that the woman kept her bed for several days after, and all the meat, bread, and other provisions, that were kept there, were so infected, that they were obliged to be thrown out of doors."

All these animals are nearly of the same form and size as the European polecat; they resemble it also by its natural habits; and the physical results of their generations are the same.

THE PEKAN AND THE VISON. The fur merchants of Canada have long been acquainted with the name of pekan, without any knowledge of the animal to which it belongs. We are also ignorant of the origin of the *vison* as well as of the *pekan*, and it is only said they belong to two different animals of South America.

The pekan so strongly resembles the marten, and the vison the polecat, that we are inclined to look on them as varieties of these two species: and to regard the pekan as a variety in the species of the marten, and the vison as a variety in that of the polecat, or, at least, to consider them as species approaching so near each other, that they do not present any real difference: the hair of the pekan and the vison is only more soft, brown, and glossy, than that of the marten and polecat, but this difference, as is known, is common to them as well as to the beaver, otter, and other animals of North America, whose fur is more beautiful than that of those of the same kind of animals in the north of Europe.

THE SABLE. Almost every naturalist has spoken of this animal without knowing any thing more of it than its skin. Mr. Gmelin is the first who has given its figure and description: He saw two living ones at the governor of Tobolski's. "The sable," says he, "resembles the marten in its shape and habit of body, and the weasel in the number of its teeth: it has large whiskers about the mouth, its feet are broad, and armed with five claws, like the rest of its kind. These characters were common to these two sables; but one of them was a dark brown, excepting the ears and the throat, where the hair was rather yellow; the other, which was smaller, was more of a yellowish cast, its ears and throat being also much paler. These are the colours they both have in winter, and which they are seen

to change in the spring; the former becoming of a yellow brown, the other of a pale yellow."

These animals inhabit the banks of rivers in shady places, and in the thickest woods: they leap with great ease from tree to tree, and are said to be afraid of the sun, which tarnishes the lustre of their robes in a very short time. They are also improperly said by some, to hide themselves, and remain torpid during the winter, when it is the chief time they are hunted, and in which they are only in season, as their skins are much finer and better at that time than in summer: they live on rats, fish, and wild fruit: they have the disagreeable odour of their kind, which is strongest during the time their heat is on them: they are mostly found in Siberia, and but very few in Russia, and there are still fewer in Lapland and other countries. The blackest skins are the most esteemed. The difference of this skin from others consists in the quality of the fur, which has no grain, and rubbed any way, is equally smooth and unresisting; whereas, the furs of other animals, rubbed against the grain, give a sensation of roughness from their resistance.

The hunting of the sable falls to the lot of condemned criminals, who are sent from Russia into these wild and extensive forests, which, for a great part of the year, are covered with snow: these unfortunate wretches remain there many years, and are obliged to furnish a certain number of skins every year: they only kill this animal by a single ball, in order to damage it as little as possible; and sometimes, instead of fire arms, they make use of the cross-bow and very small pointed arrows. As the success of this hunting trade supposes address and great assiduity, the officers are permitted to encourage the hunters, by allowing them to share among themselves the surplus of those skins which they procure; and this, in the process of a few years, amounts to a very considerable sum.

THE LEMING OR LAPLAND MARMOT, is of the shape of a mouse, but has a shorter tail: its body is about the length of five inches, covered with fine hair of various colours. The extremity of the upper part of the head is black, as are the neck and shoulders; but the rest of the body is reddish, intermixed with small black spots of various figures: the tail, which is not above half an inch long, is covered with brownish hairs, and the spots vary, also both in their form and size. In some there are many

red hairs about the mouth resembling whiskers, six of which are longer and redder than the rest. The mouth is but small, and the upper lip is divided like the squirrel's. The remains of the food in the throat of this animal incline us to imagine it ruminates. The eyes are small and black : the ears round, and inclining towards the neck ; the legs before are short, and those behind longer, which gives it a greater degree of swiftness ; the feet are clothed with hair, and armed with five very sharp and crooked claws ; the middle claw is very long, and the fifth is like a little finger, or the spur of a cock, sometimes placed very high up the leg. The colour of the hair on the belly is whitish, bordering a little on yellow, &c. This animal, therefore, whose legs are very short, runs very swift. It generally inhabits the mountains of Norway and Lapland, but descends in such great numbers in some years, and in some seasons, that the inhabitants look on their arrival as a terrible scourge, from which there is no possibility of deliverance. They move, for the most part, in a square, marching forward by night, and lying still by day. Thus, like an animated torrent, they are often seen more than a mile broad, covering the ground, and that so thick, that the hindmost touches its leader. It is in vain that the inhabitants resist, or attempt to stop their progress ; they still keep moving forward ; and though thousands are destroyed, myriads are seen to succeed and make their destruction impracticable ; they generally move in lines, which are about three feet from each other, and exactly parallel : their march is always directed from the north-west to the south-west, and regularly conducted from the beginning. Wherever their motions are turned, nothing can stop them ; they go directly forward, impelled by some strange power ; and from the time they at first set out, they never think of retreating. If a lake, or a river happens to interrupt their progress, they all together take the water and swim over it ; a fire, a deep well, or a torrent, does not turn them out of their straight lined direction ; they boldly plunge into the flames, or leap down the well, and are sometimes seen climbing up on the other side. If they are interrupted by a boat across the river while they are swimming, they never attempt to swim round it, but mount directly up its sides ; and the boatmen, who know how vain resistance would be, calmly suffer the living torrent to pass over, which it does without farther damage. If they meet with a stack of hay or corn which

interrupts their passage, instead of going over it, they gnaw their way through ; if they are stopped by a house in their course, if they cannot get through it, they continue there till they die. It is happy, however, that they eat nothing that is prepared for human subsistence : they never enter an house to destroy the provisions, but are contented with eating every root and vegetable that they meet. If they happen to pass through a meadow, they destroy it in a very short time, and give it an appearance of being burnt up and strewed with ashes. If they are interrupted in their course, and a man should imprudently venture to attack one of them, the little animal is no way intimidated by the disparity of strength, but furiously flies up at its opponent, and barking somewhat like a puppy, wherever it fastens it does not easily quit its hold : if, at last, the leader is found out of its line, which it defends as long as it can, and be separated from the rest of its kind, it sets up a plaintive cry, different from that of anger, and, as some say, gives itself a voluntary death, by hanging itself on the fork of a tree.

An enemy so numerous and destructive would quickly render the countries where they appear utterly uninhabitable, did it not fortunately happen, that the same rapacity that animates them to destroy the labours of mankind, at last impels them to destroy each other. After committing incredible devastation, they are at last seen to separate into two armies, opposed with deadly hatred along the coasts of the larger lakes and rivers. The Laplanders, who observe them thus drawn up to fight, instead of considering their mutual animosity as an happy riddance of a most dreadful pest, form ominous prognostics from the manner of their engagements : they consider their combats as a prelude of war, and expect an invasion from the Russians or Swedes, at the side, next those kingdoms happens to conquer. The two divisions, however, continue their engagements and animosity until one part overcomes the other : from that time they utterly disappear, nor is it well known what becomes of either the conquerors, or the conquered. Some suppose, that they rush headlong into the sea ; others, that they kill themselves, as some are found hanging on the forked branches of a tree ; and others, that they are destroyed by the young spring herbage. But the most probable opinion is, that having devoured the vegetable productions of the country, and having nothing more to subsist on, they then fall to devouring each other, and

having habituated themselves to that kind of food, continue it. However this be, they are often found dead by thousands, and their carcasses have been known to infect the air for several miles round, so as to produce very malignant disorders; they seem also to infect the plants they have gnawed, for the cattle often die that afterwards feed in the places where they passed. The inhabitants have an opinion, as they do not know whence such numbers proceed, that they fall with the rain.

As for the rest, the male is generally larger and more beautifully spotted than the female; they go in droves into the water; but no sooner does a storm of wind arise than they are all drowned. The flesh of the lemmings is horrid food, and their skin, although covered with a very beautiful fur, is of too little consistence to be serviceable.

THE CANADIAN OTTER, which is much larger than the common otter, must be a native of the north of Europe, as well as of Canada. It appears to be larger and blacker than the common otter; but is rather a variety than a distinct species.

THE SEAL. This animal has its head round, like that of the human species; its snout is broad, like the otter's; the eyes large and elevated; little or no external signs of ears, only two auditory passages in the sides of the head; it has whiskers about its mouth, and its teeth somewhat resemble those of the wolf; the tongue is forked at the point, the body, hands, and feet, covered with a short and bristly hair; it has no legs, but two feet, or membranes, like hands, with five toes, terminated by many claws: these membranes, which have the appearance of hands, are only larger and turned backwards, as if designed to unite with its very short tail, which they accompany on both sides. The body is thickest where the neck is joined to it, whence the animal tapers down to the tail like a fish. This amphibious creature, though of a very different nature from that of our domestic animals, yet seems susceptible of a kind of education: it is fed by putting it often in water: it is taught to salute persons with its head and its voice; it is accustomed to obey the call of its keeper, and gives many other signs of intelligence and docility.

The sensations of the seal are as perfect, and its sagacity as ready, as those of any other quadruped: both the one and the other are strongly marked by its docility, its

social qualities, its strong instinct for its female, its great attention towards its young, and by its voice, which is more expressive, and more modulated, than in other animals : its body is likewise firm and large ; it is also strong, and armed with very sharp teeth and claws, and has many particular and singular advantages over any other animals we can compare with it ; it endures both heat and cold, and feeds indifferently on grass, flesh, or fish ; it can equally live on ice, land, or in the water. This animal and the walrus are the only quadrupeds which deserve the name of *Amphibious*, or which have the *foramen ovale* open, consequently they are the only animals of that class which can exist without respiration, and to which the watery element is as agreeable as that of the air.

But these advantages, which are very great, are counterbalanced by imperfections still greater : they may be said to be deprived of the use of their fore legs, or membranes ; they are almost entirely shut up within its body, while nothing appears but the extremity of them, which are furnished with five toes, scarcely moveable, being united together by a very strong membrane, so that they might more properly be called fins than feet, as they are more adapted for the purpose of swimming than walking, the hind feet, indeed, being turned backwards, are entirely useless upon land ; so that when the animal is obliged to move, it drags itself forward like a reptile, and with an effort more painful ; for it cannot twist itself about like a serpent, but lies like a lump on the earth, and by grasping whatever it finds in its reach, drags itself up the steepest shores, rocks, and shoals of ice : by this method it moves with such a degree of swiftness, that a man cannot overtake it ; it makes its way towards the sea, and often, though wounded, escapes the pursuit of the hunter.

Seals are social animals, and generally found in great numbers in the places they frequent ; their natural climate is the northern, but they are also met in the temperate and even hot countries ; for they are seen on the shores of almost all the seas in the universe. The species alone seems to vary, and, according to the difference of climates, changes its colour, and even its shape. We have seen some of these animals alive, and many of their skins have been sent to us : out of these we have chosen two for our present subject ; the first, the Seal of the European Sea, of which there are many varieties : the proportions of the body seem different from those of any other, its tail being shorter, its

body longer, and its claws larger; but these differences are not considerable enough to make it a separate and distinct species. The second, the seal of the Mediterranean and southern seas, and which we presume to be the *phoca* of the ancients, seems to be of another species, for it differs from every other, both in the quality and colour of the hair, which is almost black, whereas in the other kind it is grey and bristly: its teeth and ears are also different; and its arms, or fins, are also situated lower, that is, more backward; nevertheless, these disagreements, perhaps, are only varieties dependent on the climate, and not specific differences, though there are numbers of these animals in those parts to be found, larger, smaller, thicker, or thinner, and of a different coloured hair, according to their sex and age.

The females of these animals bring forth in winter, and rear their young upon some sand-bank, rock, or small island, at some distance from the continent. When they suckle their young, they sit upon their hinder legs, and they continue with their dam for twelve or fifteen days, after which she brings them down to the water, accustoms them to swim, and get their food by their own industry. As each litter never exceeds above three or four, so the animal's cares are not much divided, and the education of her little ones is soon completed. The young particularly distinguish their mother's voice among the numerous bleating of the old ones, and are perfectly obedient to her call. We are unacquainted with the time of the female's gestation; but, if we judge from the time of their growth, the length of their lives, and the size of the animals, it will appear to be many months: the time also that intervenes, from their birth till they attain their full growth, being many years, the length of their lives must also be very long. I am of opinion, that these animals live upwards of an hundred years; for we know that cetaceous animals in general live much longer than quadrupeds; and as the seal fills up the chasm between the one and the other, it must participate of the nature of the first, and consequently live much longer than the latter.

The voice of the seal may be compared to the barking of an angry dog. When young, they have a shrill note, somewhat like the mewing of a cat: those that are taken early from their dams, mew continually, and very often die sooner than take the food that is offered them. These animals in general, are of a courageous nature. It is remarked,

that instead of being terrified at thunder and lightning, they are rather delighted, generally come on shore in tempests and storms, and even quit their icy abodes to avoid the shock of the tempestuous waves : at such times, they sport in great numbers along the shore ; the tremendous conflict seems to divert them, and the heavy rains that fall appear to enliven them : they have naturally a disagreeable scent, and when there are great numbers together, it is smelt at a great distance. It often happens, that when pursued, they drop their excrements, which are of a yellow colour, and of a very abominable scent. As they have a prodigious quantity of blood, and are also greatly overloaded with fat, they are consequently of a very dull and heavy nature ; they usually sleep soundly, and are fond of taking their repose on flakes of ice, or on the sides of rocks, at which time the hunters approach very near without disturbing them, and this is the usual method of taking them ; they are very seldom killed with fire arms : for, as they do not immediately die, even if they are shot in the head, they plunge into the sea, and are entirely lost to the hunter ; the general method, therefore, is to surprise them when asleep, and knock them on the head. " They are not easily killed, and are a long time dying (says a modern traveller,) for although they are mortally wounded, and their blood, nearly exhausted, and nearly stripped of their skins, yet they still continue alive : indeed, it is a disagreeable sight to see these animals wounded and skinned, wallowing and rolling about in their blood in the greatest agonies. These remarks were made on the animals we killed, which were about eight feet long, for, after they were skinned, and even deprived of a great part of their fat, yet they attempted to bite their butchers, notwithstanding they had given them powerful blows over the head and nose. One of them even seized a lance which was presented to it, with as much eagerness as if it had not been wounded ; after which we pierced it through the heart and liver, whence as much blood flowed as is contained in a young ox."

THE SEA LION. To the species of seals as above described, we may, with great propriety, add another animal, described in Anson's Voyages, by the name of the *sea lion*. They are found in great numbers on the coasts of the South Sea. The sea lion resembles our sea calf, which is very common in the same latitude, but they are much larger than any of the former, being from eleven to

eighteen feet long, and from eight to eleven in circumference. It is so fat, that when the skin is taken off the blubber is about a foot thick all round the body. About ninety gallons of oil is drawn from one of these animals; they are at the same time very full of blood, and, when deeply wounded in many parts of the body, the blood spouts out with amazing power: the throat of one of these animals being cut, it afforded two barrels of blood, besides what then remained in its body. Its skin is covered with a short hair of a brownish colour, but blackish on the tail and feet: their toes are united by a membrane which does not reach to their extremity; each of the toes is known by a claw. The sea lion differs from the seal, not only in its size and bulk, but also in some other characters; the male has a kind of thick comb or trunk hanging from the end of their upper jaw, about five or six inches long. This character is not seen in the female. The strongest males collect together a flock of females, and hinder the others from approaching them. These animals are truly amphibious; they remain all the summer in the sea, and go on shore in winter, at which season the females bring forth their young, but never above one or two at a litter, which they suckle like the seal.

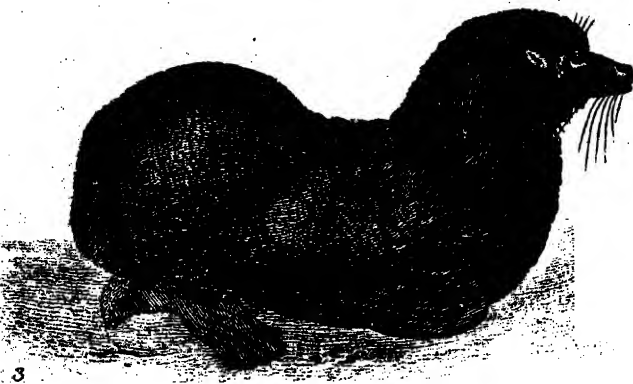
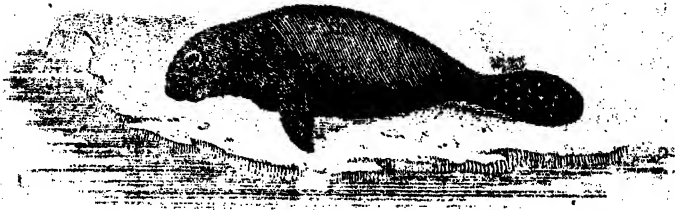
The sea lions, while they are on shore, feed on the grass by the side of the sea: they are of a very heavy and drowsy nature, and delight to sleep in the mire: but they are very wary, and at those times commonly fix some as centinels near the place where they sleep; and it is said, that these centinels are very careful to awake them when any danger is near. Their voices are very shrill, and of various tones; sometimes grunting like hogs, and sometimes neighing like horses. The males often fight with each other, when they wound one another desperately with their teeth. The flesh of these animals is not disagreeable to eat; particularly the tongue, which is as good as that of the ox. They are very easily killed, as they cannot defend themselves, nor fly from their enemies: they are so exceedingly heavy, that they move with great difficulty, and turn themselves about with still greater. Those that hunt them have only to guard against their teeth, which are very strong, and which they make use of with powerful effect on those who approach within their reach.

By comparing other observations and accounts, the sea lion of South America appears to be nearly the same as that found on the northern coast of the same continent.

The great seal of the Canadian sea, spoken of by Davis, by the name of the sea wolf, and which he distinguishes from the common sea calf, might possibly be the same as the sea lion we are speaking of. "Their young," says this author, "are larger and longer than our largest hog."

THE WALRUS MORSE, OR SEA-COW. The name of sea-cow, or sea-horse, by which the walrus is most generally known, has been very wrongly applied; since the animal which it denotes has not the least resemblance to the land animals of that name: the denomination of sea-elephant, which others have given it, is much better imagined, as it is founded on a singular and very apparent character. The walrus, like the elephant, has two large ivory tusks, which shoot from the upper jaw; its head also is formed or rather deformed like that of the elephant, and would entirely resemble it in that part if it had a trunk; but the walrus is deprived of that instrument, which serves the elephant in the place of an arm and hand, and has real arms to make use of. These members, like those of the seal, are shut up within the skin, so that nothing appears outwardly but its hands and feet: its body is long and tapering, thickest towards the neck: the whole body is clothed with a short hair: the toes, and the hands, or feet, are covered with a membrane, and terminated by short and sharp-pointed claws. On each side of the mouth are large bristles in the form of whiskers: its tongue is hollowed, the concha of the ears are wanting, &c. so that, excepting the two great tusks, and the cutting teeth, which it is deficient in above and below, the walrus in every other particular perfectly resembles the seal; it is only much larger and stronger, being commonly from twelve to sixteen feet in length, and eight or nine in circumference; whereas the largest seals are no more than seven or eight feet. The walrusses also are generally seen to frequent the same places as the seals are known to reside in, and are almost always found together. They have the same habitudes in every respect, excepting that there are fewer varieties of the morse than the seal: they likewise are more attached to one, particular climate, and are rarely found except in the northern seas.

"There was formerly," says Zordrager, "great plenty of morses and seals in the bays of Horisont and Klock, but at present there are very few. Both these animals quit the water in the summer, and resort to the neighbouring



1. Manati — 2. Walrus — 3. Harp Seal.

plains, where there are flocks of them from eighty to two hundred, particularly morses, which will remain there several days together, till hunger obliges them to return to the sea. This animal externally resembles the seal, but it is stronger and much larger: like that, it has five toes to each paw, but its claws are shorter, and its head thicker and rounder; its skin is thick, wrinkled, and covered with very short hair of different colours; its upper-jaw is armed with two teeth about half an ell or an ell in length; these tusks, which are hollow at the root, become larger as the animal grows older. Some of them are found to have but one, the other being torn out in fighting with each other, or perhaps fallen out through age. This ivory generally brings a greater price than that of the elephant, as it is of a more compact and harder substance. The mouth of this animal is like that of the ox, and furnished with hairs which are hollow, pointed, and about the thickness of a straw. Above the mouth are two nostrils, through which the animal spouts the water like a whale. There are a great number of morses towards Spitzbergen, and the profit that is derived from their teeth and fat fully repays the trouble, for the oil is almost as much valued as that produced from the whale. When the hunter is near one of these animals in the water, or on the ice, he darts a very strong harpoon at it, which, though made expressly for the purpose, often slips over its hard and thick skin; but if it has penetrated into it, they haul the animal towards the boat, and kill it with a sharp and strong lance. The morse is generally heavier than the ox, and as difficult to pursue as the whale, the skin of which is more easily pierced. For this reason, they always endeavour to wound it in the most tender part, and aim at its eyes: the animal, obliged by this motion to turn its head, exposes its breast to the hunter, who immediately strikes it very forcibly in that part, and draws the lance out again as quick as possible, for fear it should seize the lance with its teeth, and wound those that attack it. Formerly, before these animals were so greatly persecuted, they advanced so far on shore, that when it was high-water, they were at a great distance from the sea; and at low-water, being at a still greater, the hunters easily approached them and killed great numbers. The hunters in order to cut off their retreat to the sea, and after they had killed several, made a kind of barrier of

their dead bodies, and in this manner often killed three or four hundred in a season. The prodigious quantity of bones spread over the shores, sufficiently prove how numerous these animals were in former times. When they are wounded, they become extremely furious, often biting the lances in pieces with their teeth; or tearing them out of the hands of their enemies: and when at last they are strongly engaged, they put their head betwixt their paws, or fins, and in this manner roll into the sea. When there is a great number together, they are so bold as to attack the boats that pursue them, bite them with their teeth, and exert all their strength to overturn them."

We find the walrus can live, at least for some time, in a temperate climate. We do not know how long it goes with young, but if we judge by the time of its growth and size, we must suppose it to be upwards of nine months. It cannot continue in the water for a long time together, and is obliged to go on shore to suckle its young, and for other occasions. When they meet with a steep shore, or pieces of ice to climb up, they make use of their tusks to hold by, and their feet to drag along the heavy mass of their body: they are said to feed upon the shell-fish which are at the bottom of the sea, and to grub them up with their strong tusks. Others say, that they live on the broad leaves of a certain vegetable which grows in the sea, and that they eat neither flesh nor fish. But I imagine all these opinions have but a weak foundation; and there is reason to think, that the walrus, like the seal, lives on prey, especially herrings and other fish; for it does not eat at all when upon land, and it is chiefly hunger which obliges them to return to the sea.

THE SEA BEAR, OR URSINE SEAL, is an animal which inhabits the African and Indian seas. Some travellers have confounded it with the sea lion, and others have indicated it by the name of the sea bear; Spilberg and Mandelso recount "that there are animals on the island of St. Elizabeth, on the coast of Africa, which should rather be denominated sea bears than sea wolves, as their hair, colour, and head, greatly resemble those of that animal, the snout only being more pointed. They also move alike with the fore legs, but drag the hind ones after them: in other respects these amphibious animals have a frightful appearance, and do not show any fear at the sight of man; their teeth are so very strong, as

to enable them to bite through the stock of a halberd, and although their hind-legs appear crippled, yet they are able to move with such swiftness, that it is very difficult to come up with them." "Le Guat also speaks of having seen a sea cow of a reddish colour, near the Cape of Good Hope; its body was round and thick, its eyes full and large, its teeth or long tusks, and its muzzle, were turned a little upwards."

THE MANATI. This animal may be indiscriminately called the last of beasts, or first of fishes. It cannot be called a quadruped: nor can it entirely be termed a fish: it partakes of the nature of the fish by its two feet or hands; but the hind-legs, which are almost wholly concealed in the bodies of the seal and morse, are entirely wanting in the manati: instead of two short feet and a small narrow tail, which is placed in a horizontal direction in the morse, the manati has only a thick tail, spread out broad like a fan. Oviedo seems to be the first author who has given any sort of history or description of the manati: he says, "it is a very clumsy and mis-shapen animal, the head of which is thicker than that of an ox, the eyes small, and the two feet or hands are placed near the head, for the purpose of swimming. It has no scales, but is covered with a skin, or rather a thick hide, with a few hairs or bristles: it is a peaceable animal, and feeds upon the herbage by the river sides, without entirely leaving the water, swimming on the surface of it to seek its food. The hunters practise the following method to take the manati: they row themselves in a boat or raft as near the animal as possible, and dart a very strong lance into it, to the end of which a very long cord is fastened; the manati, feeling itself wounded, instantly swims away, or plunges to the bottom; but the chord, which holds the lance, has a cork or piece of wood fastened to the end of it, to serve as a buoy: when the animal begins to grow faint and weak through the loss of blood, he swims to shore; the cord is then wound up, and the animal drawn within arm's length of the boat, where they dispatch it in the water by strokes of the oar or lance. It is so very heavy, as to be a sufficient load for two oxen to draw: its flesh is excellent eating, which is eaten rather as beef than as fish. Some of these animals measure more than fifteen feet in length by six feet in breadth: the body becomes narrower towards the tail, and then spreads gradually broader towards

the end. As the Spaniards, adds Oviedo, give the appellation of hands to the feet of quadrupeds, and as this animal has only fore-feet, they have given it the name of *manati*, i. e. an animal with hands. The female has breasts placed forward like those of a woman, and she generally brings forth two young ones at a time, which she suckles. The flesh and fat of this animal (says M. de Condomine) have a great resemblance to veal. It is not, properly speaking, amphibious, since it never entirely leaves the water, having only two flat fins, close to the head, about sixteen inches long, and which serves the animal instead of arms and hands. It only raises its head out of the water to feed on the herbage by the sea-side. The eyes of this animal have no proportion to the size of its body; the orifice of its ears is still less, and only seems like a hole made by a pin. The manati is not particular to the Amazonian river; for it is not less common in Oroonoko: it is found also, though less frequently, in the Oyapoc, and many other rivers in the environs of Cayen, and the Coast of Guinea, and probably in other parts."

The manati species, however, is not confined to the seas and rivers of the New World, but is found also in those of Africa. It is, most probably, this animal which has given rise to the popular fables of mermaids. Its breast and hands bearing some resemblance to those of a woman, when it raises itself up in the water, and is only seen from a distance.



El Cero Cutangá y Angaité y Tapanahy
Tribu Guaraní

CHAP. XXI.

Of Monkeys—The Orang-Outang—The Pigmy—The Gibbon, or long-armed Ape—The Magot—The Baboon—The Mandril—The Wanderow and Lowando—The Maimon—The Maccaco and Egrct—The Patas—The Malbrouck and Chinese Bonnet—The Mangelaby—The Mona—The Callitrix—The Moustac—The Talapoin—The Douc—American Monkeycs—The Warine and Alouatto—The Conita and Exquima—The Capuchin Monkey—The Sajou, or Weeper—The Saimira, or Orange Monkey—The Sai, or Saki—The Tamarin—The Wistiti—The Marikin—The Pinch—The Mico.

THE monkey tribe is very numerous, and is usually classed by naturalists in three divisions. Those which have no tails are termed *apes*, and those which have short tails are denominated *baboons*; but by far the most numerous division consists of those which have long tails, and which are known by the general name of *monkeycs*.

THE ORANG-OUTANG, OR THE PONGO AND THE JOCKO. Orang-outang is the name this animal bears in the East Indies; *Pongo*, its denomination at Lowando, a province of Congo; and Kukurlacks in some parts of the East Indies. We shall present the orang-outang, and the jocko together, because they are, possibly, but one and the same species. We have seen the small orang-outang, or the jocko, alive, and we have preserved its skin, but we can only speak of the pongo, or great orang-outang, from the accounts travellers have given us of it. Battel assures us, "that, excepting his size, the pongo is exactly like that of a man in all his proportions: he is as tall (he says) as a giant: his face is like that of a man, the eyes deep sunk in the head, the hair on each side extremely long, the visage naked and without hair, as are also the ears and the hands; the body is lightly covered and scarcely differing from that of a man, except that there are no calves to the legs. Still, however, the animal is seen to walk on his hinder legs: he sleeps under trees, and builds himself a hut, which serves to protect him against the sun, and the rains of the tropical cli-

mates, of which he is a native; he lives only upon fruits, and is not carnivorous: he cannot speak, although furnished with greater instinct than any other animal of the brute creation. When the negroes make a fire in the woods, this animal comes near and warms himself by the blaze: he has not, however, skill enough to keep the flame alive by feeding it with fuel. They go together in companies, and if they happen to meet with one of the human species, remote from succour, they shew him no mercy. They even attack the elephant, which they beat with their clubs, and oblige to leave that part of the forest which they claim as their own. It is impossible to take any of these creatures alive, they are so strong. None of this kind, therefore, are taken, except when very young, and then but rarely, when the female happens to leave them behind; for, in general, they cling to the breast, and adhere both with legs and arms. There are two kinds of this animal, both very much resembling the human race, the pongo, which is taller and thicker than a man; and the jocko, whose size is much smaller, &c. The apes of Guinea, (says Bosman) which are called *Smitten* by the Flemings, are of a brown colour, and grow to a very large size. I have seen some above five feet tall: these apes are of a very disagreeable appearance, as well as those of another kind, which resemble them in every particular, excepting in size, which is a fourth part less than that of the former: they are very easily taught to do almost whatever their masters please." Schouten says, "That the animals, which the Indians call orang-outangs, are almost all of the same height and shape as mankind, but that their back and loins are covered with hair, of which, however, there is a deficiency in the fore part of the body; that the females have two breasts; that the face is rough, the nose flat, and the ears like those of a man; that they are robust, active, bold, and defend themselves even against armed men; that they are passionately fond of women, and that there is no safety for them in passing through the woods they inhabit, as these animals immediately attack and injure them." To these testimonies we may add that of M. de la Bresse, mentioned in his voyage to Anjou. This traveller assures us, "that the orang-outangs, which he calls *Quimpeuxes*, often attempt to surprise the female negroes, which they keep with them for the pleasure of their company, feeding them very plentifully all the

time. I knew," says he "a woman of Louando that had lived among these animals for three years. They grow from six to seven feet high, and are of unequalled strength. They build sheds, and make use of clubs for their defence: their faces are broad, their noses flat, their ears without a tip, their skins are fairer than that of a Mulattoe, but they are covered on many parts of their body with long and tawny-coloured hair: their belly is extremely large, their heels flat, and yet rising behind about half an inch: they sometimes walk upright, and sometimes upon all four when they are fantastically disposed. We purchased two of these animals, one about fourteen months old, which was a male, and a female about twelve months."

The orang-outang which I saw walked always upright, even when it carried heavy burdens. Its air was melancholy, its deportment grave, its nature more gentle and very different from that of other apes. Unlike the baboon, or the monkey, whose motions are violent, and appetites capricious; who are fond of mischief, and only obedient through fear, a look was sufficient to keep it in awe. I have seen it give its hand to show the company to the door, that came to see it, and it would walk about gravely with them, as if one of the society. I have seen it sit at table, unfold its napkin, wipe its lips, make use of the spoon and the fork to carry the victuals to its mouth, pour out its drink into a glass, touch glasses when invited, take a cup and saucer and lay them on the table, put in sugar, pour out its tea, leave it to cool before drinking, and all this without any other instigation than the signs or the command of its master, and often of its own accord. It was gentle and inoffensive: it even approached strangers with respect, and came rather to receive caresses than to offer injuries: it ate almost of every thing that was offered to it, but it preferred dry and ripe fruits to all other aliments. It would drink wine, but in small quantities, and willingly left it for milk, or any other sweet liquor. Mr. L. Brosse, who bought two young ones that were but a year old, from a negro, relates that, "even at that age they sat at table, ate of every thing without distinction, made use of their knife, spoon, and fork, both to eat their meat and help themselves; they drank wine and other liquors. We carried them on ship-board, and when they were at table, they made signs to the cabin boys expressive of their wants; and whenever they neglected attending upon them as they desired, they instantly flew into a passion,

larly found along the coasts of Coromandel, Malacca, and the Molucca islands.

THE MAGOT. Of all the apes which have no tails, this animal can best endure the temperature of our climate. We have kept one for many years. In the summer it remained in the open air with pleasure; and in the winter, might be kept in a room without any fire. It was filthy, and of a sullen disposition; it equally made use of a grimace to shew its anger, or express its sense of hunger; its motions were violent, its manners awkward, and its physiognomy rather ugly than ridiculous. Whenever it was offended, it grinned and shewed its teeth. It put whatever was given to it into the pouches on each side of its jaws, and commonly eat every thing that was offered to it, except raw flesh, cheese and other things of a fermentative nature. When it slept, it was fond of roosting on a wooden or iron bar. It was always kept chained, for notwithstanding its long subjection, it was neither civilized, nor fond of its keeper; apparently, it had been but badly educated, for I have seen others of the same kind who were more sagacious, obedient, gayer, and so tractable as to be taught to dance, and suffer themselves quietly to be clothed and dressed.

This ape is about two feet and a half, or three feet high in its erect posture; but the female is not so large as the male. It rather chooses to walk on all fours, than erect. When it sleeps, it is almost always sitting. There are two very prominent callosities on its posteriors. It differs also from the *pithecos*; first, in the form of its snout, which is thicker and longer, like that of a dog; whereas the *pithecos* has a flat visage, like the human. Secondly, in having long canine teeth; instead of which the *pithecos* has them no longer in proportion than those of a man. Thirdly, in its nails, which are neither so flat nor so round: and, in short, it is larger, and of a more sullen and untractable disposition than the other.

It is probably this kind of monkey which Robert Lade speaks of in the following terms: "We travelled over a great mountain at the Cape of Good Hope, where we diverted ourselves with hunting the large apes, which are there in great plenty. I am not able to represent all the tractableness of these animals which pursued us, nor the swiftness and impudence with which they returned to us after we had driven them away. Sometimes they suffered

us to approach so near them, that, stopping almost close to one of these animals to take my observations, I thought myself certain of securing him, when, taking a sudden leap, he sprang above ten paces from me, and climbed up a tree with the greatest agility. They remained afterwards very quiet, looking on us as though they were pleased with our astonishment. There were some so exceedingly large, that, if they had been of a ferocious nature, our number would not have been sufficient to secure us from their attacks. As it would have been useless to kill these animals, we made no use of our guns; but the Captain, thinking to wound one of them, which was seated on a tree, after a long pursuit, had no sooner presented his piece, but the animal, probably from the remembrance of the execution of some of his companions in the same manner, was so greatly terrified at it, that it fell almost motionless at our feet, and being stunned in the fall, we had not the least trouble to secure it: however, when it revived, we had occasion for all our strength and address to keep it, defending itself by biting those who were near it, which obliged us to bind our handkerchiefs over its head."

THE BABOON, properly so called, has a pouch on each side of its cheeks; it has callosities on its posteriors, which are naked and of a red colour: its tail is crooked and thick, and about seven or eight inches long. The canine teeth are much thicker and longer than those of men. Its snout is very thick and very long; its ears naked; its body and limbs are strong, thick, and short; its hair is long and thick, of a reddish brown colour, and pretty uniform over the whole body. It walks oftener on all fours than upright, and is from three to four feet high; but there seem to be different sizes of these animals. The female brings forth usually but one at a time, which she carries in her arms, and in a peculiar manner, clinging to her breast; in other respects these baboons, although mischievous and ferocious, are not carnivorous; they principally feed upon fruits, roots and corn; they generally keep together in companies, and sally forth to commit their depredations on ~~the~~ neighbouring vineyards, or orchards. "As they are extremely fond of grapes, apples, and ripe fruit, they assemble together in great numbers, and proceed on their enterprize with previous deliberation. The dogs who are set to watch do not easily conquer

these animals, as they are extremely active, and make dexterous use of their teeth and claws. On these occasions, a part of them enter the inclosure, while one of the company stands centinel; the rest stand without the fence, a small distance from each other, and form a line, reaching all the way from the inclosure to the rendezvous without, which is generally in some craggy mountain. Every thing being thus disposed, the plunderers within the orchard throw the fruit to them without as fast as they can gather it: or, if the wall or hedge be high, to those that sit at the top, and these hand the plunder to those next their side."

THE MANDRIL. This baboon is an ugly, disgusting animal, which has two nostrils independent of its nose, whence is always seen issuing a thick matter. Its muzzle is still longer than the preceding; it is of a bluish colour, and strongly seamed with wrinkles, which still increases its frightful and loathsome appearance.

This baboon is found on the Gold Coast, and in other southern provinces of Africa, where the Negroes call it *Boggo*, and the Europeans *Mandril*. This animal is the largest of the baboon kind. Smith relates, that a female mandril was given to him, which was not above six months old, and had then attained the size of an adult baboon: he likewise acquaints us, that these animals walk always erect; that they sigh and cry, like the human species; that they have a violent passion for the female sex; that they never fail to overcome them, if they find them within their reach.

THE WANDEROW, AND THE LOWANDO. As these two animals seem to be but one and the same species, we have, therefore, here preserved the two names they bear in Ceylon, as they at least form two distinct breeds. The body of the wanderow is covered with brown and black hairs, and has a long white head of hair, and a monstrous white beard: the body of the lowando, on the contrary, is covered with whitish hairs, but has the like large head of hair and beard. There is still a third variety found in the same country, which may possibly be the common stock of the other two, because it is of an uniform whitish colour over its body, with the like head of hair and beard: these animals are baboons, and not, as some have imagined, monkeys, as they have all the characters, as well in shape as in disposition, and are of the same savage nature, and even more ferocious.

"The white monkeys," says Forbin, "are sometimes as



big as the largest English mastiff: they are more dangerous than the black: they principally attack women, and often, after having greatly injured them, finish their cruelty by strangling. Sometimes they even come to their houses; but the Macaroës, who are very jealous of their wives, take care to prevent their entrance into their habitations; and the females not liking (as the chevalier humorously relates) either the manners or the figure of the paltry gallants, boldly stand on their defence, and with clubs, or whatever other arms they can provide, instead of answering their caresses, oblige their ugly suitors to return, not, however, before they have damaged or blundered every thing they can lay their hands on."

THE MAIMON has pouches on each side of its cheeks, and callosities on its posteriors; its tail is naked, curled up, and about the length of five or six inches; the canine teeth are not much longer in proportion than those of men; the snout is very broad; the orbits of the eyes very acute above; the face, ears, hands, and feet, are naked, and of a flesh colour; the hair of a dark olive on the body, and of a yellowish colour on the belly; it sometimes walks erect, and at other times upon all fours: it is about two feet, or two feet and a half tall when erect.

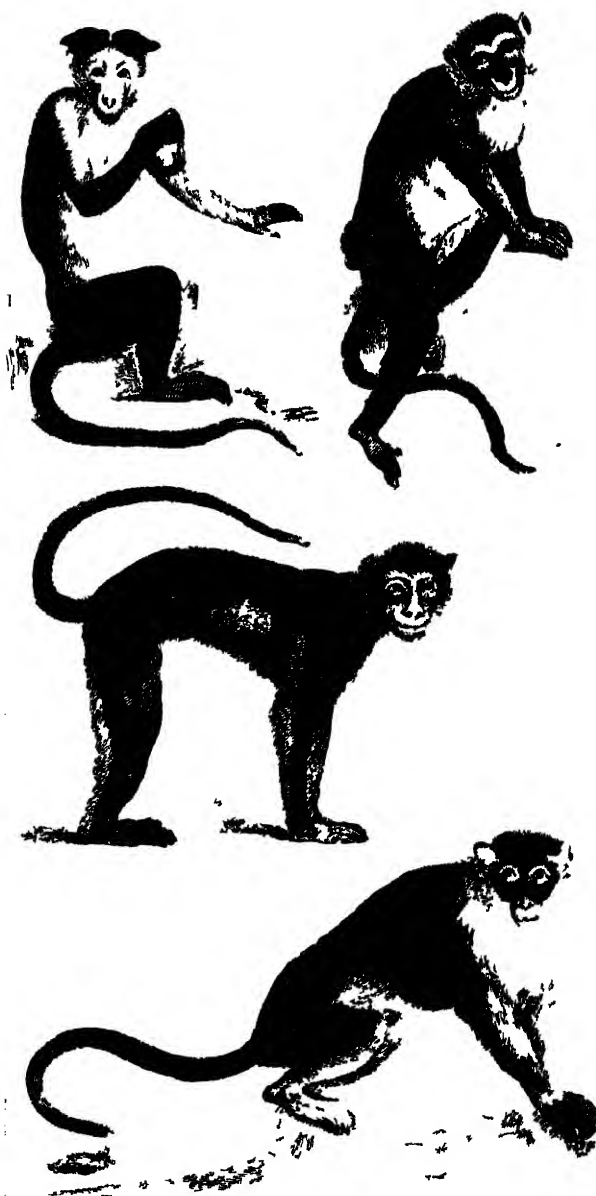
THE MACACCA, AND THE EGRET. Of all the apes, or monkeys, with long tails, the macacco approaches nearest the baboon: its body being short and compact, like that animal's; its head thick, its snout broad, its nose flat, its cheeks wrinkled, but it is bulkier and taller than most other monkeys. It is also so extremely ugly, that it may well be looked upon as a smaller kind of the baboon, if it did not differ in the tail, which is crooked, but longer and tufted; whereas, that of the baboon in general is extremely short. This species is a native of Congo, and other southern parts of Africa. It is numerous, and subject to many varieties with respect to its size, colour, and disposition of the hair. The body of that described by Hasselquist, was more than two feet long; and those which we have seen, were not above one foot and a half. That which we here term the *Egret*, because of the plume on its head, seems to be only a variety of the first, which it perfectly resembles, excepting the difference before mentioned, and some other slight varieties in the hair; both of them are tractable and docile; but independent of the scent which they diffusé around them, they are so mishapen, and even

so hideous when they grimace, that we cannot look on them without horror and disgust. These monkeys go in flocks. Basman relates, that they take a melon in each hand, under their arms, and one in their mouths, which they go off with ; if the pursuit is hot, they drop first that from under their arm, then that from their hand ; and if it be continued, they at last let fall that which they had hitherto kept in their mouths. In other respects, says this traveller, they examine the melon beds carefully, and what does not please them they throw away, and tear up others ; so that, by this nicety, they do exceedingly great injuries to many of the orchards and vineyards by their depredations.

THE PATAS, is a native of the same country, and is nearly of the same size as the macacco, the body being only somewhat longer, the face not so ugly, and the hair fairer. It is, indeed, of so brilliant a red, that the animal looks as if it were painted. I am inclined to think, that the monkey spoken of by Marmot, and said to be of the colour of the wild cat, and to be a native of Africa, is only a variety in the patas species. These animals are not so subtle as others of their kind, but are possessed of an extreme curiosity. " I have seen them," says Bruce, " descend from the top to the branches of very high trees, to view the vessels on the water, which they admired for some time, and seemed diverted with what they had seen ; they quitted their stations for their companions to have the same sight : some even threw the branches of the trees at the French, who returned their salute with a musket ball ; some were killed, others wounded, and the rest fell on the ground in the utmost consternation. One part uttered most hideous cries, while another was picking up stones to throw at their enemies, and a third were occupied in the easing of nature into their hands, which presently they sent with vengeance to the spectators ; but perceiving at length, how unequal the battle was, they desisted, and prudently retired."

THE MALBROUCK, AND THE CHINESE BONNET. These two monkeys, or apes, with a long tail, seem to belong to one species ; and this species, although somewhat different from that of the macacco, is nevertheless, so far bordering on it, as to give us reason to suppose the macacco, egret, malbrouck, and the bonnet chinois, to be only four varieties.

These animals are found in Bengal, where travellers inform us they plunder whole fields of grain, and plantations



1. Chinese Bonnet 2. Mangabey 3. Callitrix 4. Mousa

of sugar canes; and while one stands centinel on a tree, the others load themselves with the booty. But if the

owner of the field, or plantations, appear to interrupt their depredations, their faithful companion on the look out, gives notice by crying out *houp, houp, houp*, which the rest perfectly understand, and all at once, throwing down their plunder, which they hold in their left hands, they scamper off upon three legs, holding the remainder in their right, and save themselves from their pursuers by climbing up trees, where they have their general abode. The females, even loaded with their young ones, clasp them close to their breast, leap like the others from branch to branch, and escape with the rest. When it happens they cannot find any provision in the fields, they get on the tops of houses and, having pulled off the tiles, do great damage to the inside. They do not eat a single thing without smelling at it for a long time before hand, and when they have satisfied their hunger, they put the remainder in the pouches on the sides of their cheeks for the next day; they destroy the nests of birds, and never fail to throw the eggs on the ground when they want appetite or inclination to eat them.

The most formidable enemy these animals have is the serpent, no other animal of the forest being able to surprise them, as they are so exceedingly swift and subtle, and easily climb up and seat themselves on the tops of the highest trees. "The monkey," says a traveller, "has it in his power to be master of the forest, for there are neither tigers nor lions which can dispute the possession with it: the chief animal it has to fear, and which attacks them both night and day, is the snake. There are some snakes in those forests of a prodigious size, which wind up the trees where the monkeys reside, and when they happen to surprise them sleeping, swallowing them whole before the little animals have time to make a defence."

The malbrouck has pouches on each side of its cheeks, and callosities on its posteriors; its tail is very near as long as the body and head put together. The eyelids are of a fleshy, and the face of an ash colour; the ears are large, thin, and of a flesh colour; they have a list of grey hairs on them like the mona; but in other parts are of an uniform colour, approaching towards a brown on the upper parts of the body, and towards a grey on the lower. It goes on all fours, and is about a foot or a foot and a half long from the snout to the insertion of the tail.

The chinese bonnet seems to be a variety of the malbrouck, it differs from it in the hair on the crown of its

head, which is disposed in the shape of a cap or flat bonnet; and in its tail, which is large.

THE MANGABEY. We have seen two of this kind of monkey; both were sent to us by the denomination of *Madagascar monkeys*. They are easily distinguished by a very apparent character. The mangabey has its eyelids naked, and of a striking whiteness. It has pouches on each side of its cheeks, and callosities on its posteriors. Its tail is as long as the head and body put together, and it has a prominent roll of hair over its eyes. Its snout is thick and long, its eyebrows rough and bristly; its ears black and almost naked: the hair of the upper parts of its body is brown, and those below grey. There is a variety in this species, some being of an uniform colour, and others having a circle of white hair round the neck, and the form of a beard round their jaws. They walk on all fours, and are nearly a foot and a half long from the snout to the tail.

THE MONA, OR VARIED MONKEY, is the most common of the monkey tribe. We kept one of them alive for many years. This alone is sufficient to prove it is not a native of the hot countries of Africa and India. In fact, it is met with in Barbary, Arabia, Persia, &c. The visage of this animal is of a brown hue, with a kind of white beard, mixed with yellow and a little black; the back is red and black; the belly and the hind parts of the thighs and legs whitish, though the fore parts of the two last are of a black colour; the tail is of an ash-colour, marked with two white spots, one on each side, at its insertion. On its forehead the hair is of a grey colour, in the form of a crescent, and between the eyes and the ears is a black stripe, as there is from the ears, shoulders, and arms.

In general the disposition of the monkey is much more tractable than the baboon, and not so sullen as the ape: it is extravagantly spirited, but not ferocious, being docile through fear. The mona is in particular susceptible of education, and even attached to those persons who take care of it. That which we brought up would suffer itself to be stroked and handled by those it knew, but would often bite strangers. It was chained, but was very desirous of its liberty; for when it either broke its chain, or got loose, it would run away, and would not suffer itself to be retaken by any other person than its master. It eat every thing that was offered to it, especially flesh, bread, and its favourite food, fruits. The mona is about a foot and a half in length.

THE CALLITRIX, OR GREEN MONKEY, has got pouches on each side of its cheeks, and callosities on its posteriors: the tail much longer than the whole body. Its head is small, its snout long, and its face and ears of a black colour: it has a narrow stripe instead of eyebrows, formed of long black hairs: it is of a fine green colour, with a little yellow mixed with it: it walks on all fours; and the length of its body, including its head, is about fifteen inches.

The callitrix is found in Senegal, as well as in Mauritania and the neighbouring islands. Mr. Adanson relates, that the environs of the woods of Podor, along the Black Sea, are filled with green monkeys. "I only discovered these animals," says he; "by their breaking off the branches of trees, and throwing them down on my head; for they were so very quiet and nimble in their tricks that I could scarcely hear them. I did not walk far before I killed three of them without in the least terrifying any of the rest; however, when numbers felt themselves wounded, they began to retreat, some concealing themselves behind large branches, and others descending and running away; but the greatest number leaped from the top of one tree to another. During this little fray I killed about twenty-three in less than an hour, without any of them uttering a single cry, although they made an appearance of attacking me."

THE MOUSTAC seems to be a native of the same country as the macacco. It is, probably, the same animal as the Guinea travellers call *White Nose* from its upper lips being of a white colour, whereas all the rest of its face is of a deep blue. It has also two tufts of yellow hair below its ears, which give it a very remarkable air: and, as it is only but small, it seems to be the most beautiful of the monkey kind.

The moustac has pouches on each side of its cheeks, and callosities on its posteriors. The tail is much longer than the head and body together. Its face is of a deep blue, with a great and broad white mark in the shape of a chevron under the nose, which is naked. There is only a slight edging of black hair both on the upper and under lip. Its body is short and compact. There are two thick tufts of hair of a bright yellow colour below the ears, and another tuft of bristly hair upon the head; the hair of the body is of a greenish cast, and the breast and belly of an ash colour. It walks on all fours, and is about a foot long. The female is subject to a periodical emanation.

THE TALAPOIN is a pretty small animal ; its name indicates it to be a native of Siam, and other eastern provinces of Asia, but we cannot speak positively as to that point ; however, it is certain, it is a native of the Old Continent, and not found any where in the New, from the pouches on each side of its cheeks, and callosities on its posteriors, which characters neither belong to the sagoins, nor sapajous, which are the only animals of the New World which we can compare with the monkey.

Edwards has given a figure and description of a monkey, by the name of the Black Monkey, of a moderate size, which seems to approach nearer the talapoin than any of the rest. It is also, probably, the same species of black monkeys, which Bosman speaks of, by the name of *Bourdman-metjes*, the skin of which, he informs us, makes a good fur.

THE DOUC is the last among the class of animals, called Apes, Baboons, and Monkeys. This animal, without belonging to any one of these three precisely, yet partakes of them all. Of the monkey, in the length of its tail ; of the baboon in its size ; and of the ape, by the flatness of its face. It has, besides, a very particular character, by which it seems to fill up the chasm between the monkey and the sapajou. These two families of animals differ between themselves, the monkey having fleshy posteriors, and all the sapajous having them covered with hair. The douc is the only monkey which has hairy posteriors like the sapajou : it resembles it also by the flatness of the snout ; but it is infinitely nearer the monkey than the sapajou, by its long tail, and by other very essential characters. Its variegated skin seems to indicate the ambiguity of its nature, and, at the same time distinguishes its species in a very evident manner. It has a purple collar about its neck, a white beard, its lips are brown, and the skin round its eyes is black ; its face and ears red, the top of the head and body grey, the breast and belly yellow, the legs white downwards, the feet black upwards, and the tail white, with a large spot of the same colour upon the loins.

Travellers inform us, that the larger monkeys of the southern parts of Asia produce bezoar in their stomach, which is superior to that of the bezoar of goats and gazelles. These larger monkeys of the southern parts of India are the wanderow and the douc. We, therefore, suppose, that we must refer the production of the bezoar to this species. It is pretended, that this monkey bezoar is always of a round form, whereas the other bezoars are of different sizes and figures.



1. *Leone* 2. *Coenata* 3. *Salpeter* 4. *Grey* *Lapua*

The douc has no callosities on its posteriors, and is clothed all over with hair : its tail, though long, is not so long as its body and head put together ; its face is covered with reddish down, the ears naked, and of the same colour as the face ; the lips brown, as are the orbits of the eyes : the colour of the hair is very bright, and very variegated ; it has a collar of a purple colour round its neck ; its forehead, body, arms, legs are white, and on the chin is a kind of yellow beard ; it is black above the forehead and the upper part of the arms ; the parts below the body are of an ash colour ; the tail is white as well as the bottom of the loins ; it more frequently walks on two feet than on four, and it is three feet and a half, or four feet high when it is upright.

OF THE MONKEY TRIBE IN AMERICA. All the four-handed animals which we have given a description of, and which we have comprehended under the generical names of Apes, Baboons, and Monkeys, exclusively belong to the Old Continent ; and all those which remain to be spoken of, are, on the contrary, only found in the New World. We here distinguish them by two generical names, as we can divide them into two classes ; the first into that of the SAPAJOU, and the second into the SAGOIN. Both these animals have their feet nearly like those of the ape and monkey kind, but they differ from the ape in having tails. The sapajou has a very long tail, which it makes use of to seize and lay hold of things, and by which it suspends from the branches of trees. The tail of the sagoin, on the contrary, is proportionably longer than that of the sapajou, but is weak and straight, so that they cannot make use of it either to lay hold of any thing, or for the purpose of climbing ; this difference is so very apparent, that it is alone sufficient to distinguish the sapajou from the sagoin.

THE WARINE AND THE ALOUATTO are the largest of these animals belonging to the New Continent : they surpass the size of the largest monkey, and approach the size of the baboon : they have a long tail, and are moreover of the sapajou family, in which they hold a very distinct rank, not only with regard to size, but also to voice, which sounds like a drum, and may be heard at a very great distance. Marcgrave informs us, that "every morning and evening the *warines* and the *alouattos* assemble in the woods ; that one among them seats himself on an elevated place, makes a sign with his hand to the rest to seat

they all round him; as soon as he sees them all seated, he begins an oration with so quick and loud a voice, that, at a distance, it might be imagined they were all making a noise together. During the whole discourse the rest keep a profound silence, and when it is ended, he makes a signal to the rest to answer him, and immediately they all set up a cry together, till by another sign with his hand, he orders them to be silent: when they are immediately obedient and quiet. Then the first renews his discourse, or his song, which when finished, and the others have paid the utmost attention to it, the whole assembly breaks up and separates." According to the same author, "the face of the *warine* is broad, the eyes black and sparkling, the ears short and round, the tail naked at the extremity, with which it holds firmly whatever it encircles: the hair of the body is black, long, and glossy; it is much longer under the chin, which forms a kind of round beard: the hair on the hands, feet, and a part of the tail, is brown. The male is of the same colour as the female, and only differs from it in being a little larger. The females carry their young on their backs, and thus loaded, leap from branch to branch, and from tree to tree. The young one clasps the narrowest part of the body of the mother with its hands and arms, and thus holds itself firmly fastened, whatever motion its parent takes. In other respects, these animals are wild and mischievous; they can neither be tamed nor subdued, and bite dreadfully. As they live only on fruit, grain, and some insects, their flesh is not bad eating. It is like that of the hare, but a little sweetish, for which reason a good quantity of salt is put to that which is roasted: the fat is yellow, like that of the capon, and of a very fine flavour. They easily fasten upon the branches of trees, and stick either by their hands, feet, or tail, wherever they touch, which renders it very difficult to take them, even after they are shot, for if they are only wounded, they will not fall to the ground, but cling to the branch, and remain on the tree where they were shot, till they drop off by putrefaction. What appears singular is, that the moment one of them is wounded, the rest assemble round, and clap their fingers into the wound, as if they were desirous of sounding its depth. If the blood then flows in any quantity, they keep it shut up, while others get leaves, which they chew, and thrust into the orifice. The females bring forth only one at a time."

The *alouatto* has the same characters as the *warine*, and

only seems to differ from it in having no beard, and a reddish-coloured hair, whereas that of the warine is black.

THE COAITA, AND THE EXQUIMA. Next to the warine and the alouatto, the coaita is the largest of the sapajous. There was one alive at the Duke of Bouillon's, where, by its familiarity, and forward caresses, it merited the affection of those who had it under their care; but in spite of the good treatment and attention paid to it, it could not resist the winter of the year 1761. It differs greatly in disposition from the warine and the alouatto, which are wild and untameable. It also differs from them in having but four fingers and no thumb to the fore paws: by this character alone, and its holding tail, it is easily distinguished from the monkey kind.

The animal which Marcgrave calls *Exquima*, is of nearly the same species with the *coaita*, and, perhaps, is only a variety of it. We learn, by the testimonies of travellers, that there are both black and white coaitas, the one beardless, and the others with a beard. "There are," says Dampier, "in the Isthmus of America, numbers of monkeys, some of which are white, but the most part black—some have beards, others none. These monkeys are very droll, and performed a thousand grotesque postures as we traversed in the woods. When they are unable to leap from one tree to another, on account of the distance, or the tree being separated by a river, their dexterity is very surprising. The whole family form a kind of chain, locking tail in tail, or hand in hand, and one of them holding the branch above, the rest swing down, balancing to and fro like a pendulum, until the undermost is enabled to catch hold of the lower branches of some neighbouring tree. When the hold is fixed below, the monkey lets go that which was above, and thus comes undermost in turn; but, creeping up along the chain, attains the next branches of the tree like the rest; and thus, they all take possession without ever coming to the ground."

They have the address to break the shell of the oysters to eat them. They generally produce only one or two young ones at a time, which they carry upon their backs; they feed upon fish, worms, and insects, but fruit is their general food, and they grow fat when it is ripe, when it is said their flesh is good and exquisite eating.

The coaita is about a foot and a half long, and its tail is longer than the head and body measured together: it goes on all four.

The exquima is nearly of the same size as the coaita : it has not, however, its hair of a black colour over all the body, but it varies in its colour ; there are some black and brown on the back, and white on the belly, with a very remarkable beard.

THE SAJOU, OR CAPUCHIN MONKEY. We are acquainted with two varieties in this species ; the brown sajou, commonly called the *Capuchin Monkey* ; and the grey sajou, which only differs from the other in the colour of its hair ; they are both lively, active, and very pleasing by their tricks and nimbleness. They are, however, fantastical in their tastes and affections : they seem to have a strong inclination for some people, and as great an aversion for others.

THE SAI, OR WEEPER. We have seen two of these animals, which seem to make a variety in the species. The hair of the first is of a deep brown ; the hair of the second, which we have called the *White-throated Sai*, is white on the breast, neck, ears, and jaws. Travellers have described these animals by the name of *Howlers*, from their plaintive moan. Others have called them *Musk Monkeys*, from their having, like the macacco, that peculiar smell. They belong to the sapajou family, as they have a holdin g tail : they have only two teats, and bring forth but one or two at a time. They are gentle, docile, and so timorous, that their common cry, which resembles that of the cat, is dwindled down to a kind of sighing when they are threatened. Their food, in this climate, is principally snails and beetles, which they prefer before any other ; but in their native country of Brazil, they chiefly live upon grain, and the wild fruit they pluck from trees, whence they very seldom descend, till they have stripped their habitation of its treasure.

THE SAIMIRI is vulgarly known by the name of the *Golden Orange-coloured*, or *Yellow Sapajou*. It is common in Guinea. By its air, size, the brilliant colour of its coat, the fulness and brightness of its eyes, and its small, round visage, the saimiri has ever taken the lead of every other sapajou : it is, in fact, the most beautiful and delicate of the kind, and the most difficult to transport and preserve in other countries. Its tail, without being absolutely useless and weak, like that of the sagoin, is also not so muscular as that of the sapajou : its tail may be



said to be but half-holding; and though it makes use of it to climb up trees, yet it can neither strongly hold, nor firmly fix itself with it. It is scarcely more than ten or eleven inches in length. It sits upright on its hinder feet with great ease: but it walks commonly on all fours.

THE SAKI, commonly called the *Fox-tailed Monkey*, from its tail being clothed with very long hair, is the largest of the sagoin kind, being about seventeen inches long; whereas, the size of the five other sagoins is not above nine or ten. The saki has very long hair on its body, and still longer on its tail. Its face is red, and covered with a whitish down.

THE TAMARIN, or GREAT-EARED MONKEY, is much smaller than those we have just described, (being about seven or eight inches in length,) and differs from them in many characters, particularly in the tail, which is clothed only with short hair; whereas, that of the saki is furnished with very long. The body, head, and tail, are covered with dark brown, bristly hair: and it is remarkable for the largeness of its ears, and its yellow feet. It is a pretty and lively animal, very easily tamed, but so exceedingly delicate as not to be able long to resist our climate.

THE WISTITI, or STRIATED MONKEY. The name of this animal is taken from the sound of its voice. It is smaller than the tamarin, being not above six inches long, and its tail more than double that length, which is annulated black and white, like the macacco's. Its face is naked, and of a flesh colour. It has two very singular tufts of long white hair on the fore part of the ears, which, although very large, cannot be seen by looking at the full face of this animal. Mr. Edwards says, that, when it is in good health, it has much hair and tufted: that one of those which he saw, and which was healthy, fed on several things, as biscuits, fruit, pulse, insects, snails; and, being one day unchained, he struck at a little gold-fish which was in a glass globe, killed it, and devoured it with the greatest avidity; that afterwards, some small eels being put before him, he was frightened when they twisted about his neck, but that he soon conquered and eat them. These animals, when young, have an ugly appearance, having scarcely any hair on their bodies. They cling closely to the teats of their dam; and, as they grow older, they fix themselves on

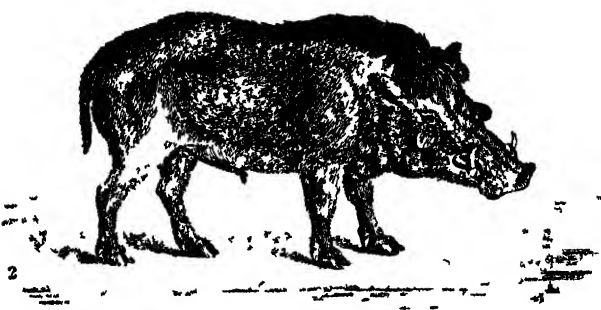
her back or shoulders ; when she is weary of carrying them, she releases herself by rubbing against the wall.

THE MARIKA is sufficiently known by the vulgar name of the Small Lion Monkey. It is about eight inches long, and has a small tuft of hair at the end of the tail ; its hair is tufted, long, soft, and glossy ; the head is round ; the face is brown ; the eyes red ; the ears round, naked, and concealed under the long hair which encompasses the face. This hair is of a bright red ; that on the body and tail of a very pale yellow, approaching towards white. This animal has the same manners, the same vivacity, and the same inclination as other sagoins, and seems to be of a more robust temperament. We have seen one which lived five or six years at Paris, by the care alone of keeping it, during the winter, in a chamber, wherein a fire was kept every day.

THE PINCH is about nine inches long ; and its tail is as long again. It is remarkable for a kind of white and striped hair on the top and sides of the head ; its face is black, shaded by a small grey down ; its eyes are black, its tail of a bright red at its insertion, and even as far as half its length, where it changes to a deep brown. The hair of the upper parts of the body is of a brown colour ; that of the breast, belly, hands, and feet, is white ; the skin is black, even where covered with white hair ; its throat is naked and black, like its face ; its voice is soft, and resembles more the pipe of a little bird, than the cry of an animal ; it is very delicate, and cannot be transported from America into Europe without the greatest precaution.

THE MICO. We owe the knowledge of this animal to M. de la Condamine, and shall therefore give this author's account of it, in his voyage up the Amazonian River. " The Mico which the Governor of Para made me a present of, was the only one of its kind that had been seen in the country. The hair of its body was of the most beautiful silver colour, its tail glossy, and approaching to black. It had another more remarkable singularity ; its ears, jaws, and snout, were tinged with so bright a vermillion as scarcely to be thought natural. I have had it a year ; and it was alive at the time I was writing this account, almost within sight of the French coast, where





1. Soudah - 2. Cape Voul - Boar - 3. Tartarian Bison

I hoped to have brought it alive; but, notwithstanding the continual precautions that I took to preserve it from the cold, yet the rigour of the season probably killed it."

CHAP. XXII.

The Tartarian Cow—The Total—The Zisel—The Zemni—The Pouch—The Perouasca—The Souslik—The Golden-coloured Mole—The White Water Rat—The Guinea Hog—The Wild Boar of Cape Verd—The Mexican Wolf—The Alco—The Tayra—The Philander of Surinam—The Akouchi—The Tucan—The Brazilian Field Mouse—The Aperca—The Tapeti—The Juda Goat—The Kangaroo—The Kangaroo Rat—A view of the Animals peculiar to each Continent.

THE TARTARIAN COW

MR. Gmelin, in the new Memoirs of the Royal Academy at Petersburg, has given the description of this animal, which seems, at first sight, to be a quite different species from all those we have spoken of under the article of buffalo. "This cow," says he, "which I saw alive, and had painted in Siberia, came from Calmuchia, and was about the length of two Russian ells and a half; by which model we may judge of the other dimensions. The body resembles that of the common cow; the hair on the body is black, except on the forehead and spine of the back, where it is white. The neck is covered with a mane, and all the rest of the body with a very long hair, which descends to the knees, so that the feet appear very short; the back is raised in the form of a hunch; the tail resembles that of a horse, white and well clothed with hair; the fore feet are black, and the hinder ones white; there are two tufts of long hair, one before and the other behind. The excrements are of a more solid nature than those of the common cow; and it grunts like a hog. It is wild, and even ferocious; for, excepting the man who feeds it, it butts all those that come near it with its head; and it dislikes the company of domestic cows."

THE TOTAL. This animal, which is very common in Baikal Lake, in Tartary, is a little larger than a rabbit,

which it resembles in shape, quality, smell, and colour, and also in the habit of burrowing in the earth to conceal itself. It differs only in the tail, which is considerably longer than that of the rabbit.

THE ZISEL is smaller than the hamster: its body is long and slender, like the weasel: whereas, that of the hamster is thick and compact, like that of the rat. It has no external ears, but only auditory passages concealed under the hair. The Zisel is of a greyer, or of a more uniform colour than the hamster; and the latter is marked in the fore part of its body with three large white spots on each side. These differences joined to that of their not mixing together, though natives of the same country, are sufficient to leave us not the least room to doubt of their being two different species.

THE ZEMNI. There is another animal in Poland and Russia which is called *ziemni*, or *zemni*, of the same race as the *zisel*, but larger, stronger, and more mischievous. It is somewhat smaller than the domestic cat; its head is large, its body slender, and its ears short and round. These have four great incisive teeth: the two in the lower jaw are thrice as long as the two in the upper. The feet are very short and hairy, divided into five toes, and armed with crooked claws; the hair is soft, short, and of a mouse colour; the tail moderately large; its eyes small and hid, like those of the mole. Its disposition and habits are nearly the same as those of the hamster and zisel; its bite is dangerous; it eats greedily, and plunders orchards and gardens; it burrows, and lives upon grain, fruit, and pulse, which it stores in magazines for its winter support.

THE POUCH is larger than the domestic rat; its snout is long; it burrows, and commits depredations in the gardens, &c. There are such numbers near Suraz and Volhinia, that the inhabitants were obliged to abandon the culture of their gardens.

THE PEROVASCA, which the Russians call *Pereziaska*, and the Polanders *Pizewiaska* (a name we may translate the *cinctured weasel*), is not so large as a pole-cat, covered with a whitish hair, transversally striped of a reddish colour, which appear as so many girdles. It lives in the woods, and burrows in the earth; its skin is sought after, and makes a very beautiful fur.

THE SOUSLIK. There is found at Casan, and in the provinces which the Volga pervades, a small animal, called *Souslik* in the Russian tongue, of which very beautiful furs are made. Its tail is short, like the field-mouse: but what distinguishes it from that and every other rat, is its coat, which is of a greyish hue, sprinkled with small spots of a glossy and bright white colour: these little spots are exceedingly small, at a small distance from each other; they are more apparent upon the loins of this animal, than on the shoulders and head. "The rats called *Sousliks*," says M. Sanchez, "are taken in great numbers on the salt vessels in the River *Kama*, which descends from Salikamskia, where the salt-pits are, and falls into the Volga below Casan. The Volga, from Simbuski to Somtoff, is covered with these salt vessels; and these animals are taken on those vessels, and the borders of those rivers: their name is *Souslik*, i. e. *dainty-mouthed*, because they are very fond of salt."

THE GOLDEN-COLOURED MOLE. Not to omit any animals that belong to the north, we shall take notice of a kind of mole found in Siberia, called the *Golden-coloured Mole*, the species of which may be different from the ordinary mole, because the Siberian has no tail, and a short snout; the hair red and green; only three toes to the fore feet, and four to the hinder; whereas, the common mole has five toes on every foot.

THE WHITE WATER RAT. The European water rat is again seen in Canada, but its colour is different; its back is only brown; the rest of the body is white and brown; the head and snout are white, as is the extremity of the tail; the hair seems softer and more glossy than that of our water rat; but they are alike in every other respect; so that we cannot doubt but that these two animals are of the same species; the whiteness of the hair being produced by the coldness of the climate.

THE GUINEA HOG is nearly of the same figure as our hog, and about the same size as the Siam hog; that is to say, smaller than our boar, or our hog. It is a native of Guinea, and has been transported into Brazil, where it has multiplied, as in its native country; it is domestic and tame: its hair is short, red, and glossy; it has no bristles, not even on the back; the tail only, and the crupper near

the tail, are covered with longer hair than the rest of the body : its head is not so large as that of our hog ; and its ears are very long, and turned backwards over its neck ; its tail is as much longer, almost touching the ground ; and it has no hair towards its extremity.

THE WILD BOAR OF CAPE VERD There is another hog, or Wild boar, at Cape Verd, which by the number of its teeth, and enormous size of its two tusks of the upper jaw, seems to be of a different breed, and, perhaps, of a different species, from every other hog, and approaches nearer the Babyroussa. These tusks resemble ivory horns, rather than teeth ; they are half a foot long, and five inches round at the base, and are crooked nearly like the horns of a bull.

THE MEXICAN WOLF has the same figure, the same appetites, and the same habitudes, as the European or North American Wolf ; and every thing seems to prove them to be of one and the same species ; its head, however, is larger, its neck thicker, and the tail not so hairy ; above the mouth, there are some thick bristles, but not so rough as those of the hedge-hog ; the body is covered with greyish hair, marked with some white spots ; the head, which is of the same colour as the body, is crossed with brown stripes ; and the forehead is adorned with farrow-coloured spots ; the ears are of a grey colour, like the head and body. There is a long spot, of a fallow colour, on the neck ; a second spot, like the first, on the breast ; and a third on the belly. The flank is marked with transversal lists, from the back to the belly. The tail is grey, and marked with a farrow spot on the middle ; the legs are striped, from top to bottom, of a grey and brown colour. This wolf, as we observe, is the most beautiful of the kind ; and its fur is greatly valued.

THE ALCO, OR MEXICAN DOG. Besides the dogs, says Fernandez, which the Spaniards have transported into America, we met with three other species there, which resemble ours, both in nature and manner, and which do not greatly differ from it in form. The first, and the longest of these American dogs, is that called *Xoloigt-cuintli*. What is particularly remarkable in these animals, is, their being without hair, and only covered with a soft, close skin, marked with yellow and blue spots. The se-

cond is clothed with hair, and, with respect to its size, sufficiently resembles our little Malta dogs. It is marked with white, black, and yellow; it is singular and amusing by its deformity, having a hunched back, and an exceeding short snout; so that the head seems to shoot immediately out of the shoulders; it is called *Micuacanens*, from the name of its country. The third kind of these dogs, called *Techichi*, sufficiently resembles our little dogs; but its look is dull and savage. The Americans eat their flesh. The word *Alco* appears to be a generical term.

THE TAYRA, OR GALERA, is about the size of a small rabbit, and resembles the weasel or the ferret. It burrows like those animals, and has its fore feet very strong, and considerably shorter than the hinder ones. Its snout is elongated, a little pointed, and adorned with a whisker. The body is oblong, and greatly resembles that of a rat; it is covered with brown hair, some of which is pretty long, and in others much shorter. This animal resembles the species of ferret, or pole-cat. Linnaeus, with some reason, supposes, that the black weasel of Brazil is also found in Guinea, where it is called *Tayra*.

THE PHILANDER OF SURINAM. This animal belongs to the same climate, and is of a near species to the sariga, marimose, cayopolin and phalanger. It has very sparkling eyes, surrounded with a circle of deep brown hair. The body is covered with a soft hair, or rather a kind of wool, of a reddish colour, which is fair on the back, and of a yellowish colour on the snout, forehead, belly, and feet. The feet resemble the hands of the ape; the fore feet having four fingers and a thumb, with short and obtuse nails; whereas, only the thumb or great toe of the hinder feet is flat and obtuse, the rest being armed with small, sharp claws. The young of these animals grunt somewhat like a pig: they get on the back of their dam, and fix themselves there, by fastening their tails to her's. In this situation, which is familiar to them, they are carried with as much safety as swiftness.

THE AKOUCHI is common in Guinea, and other parts of South America. It differs from the agouti by having a tail. The akouchi is generally smaller than the agouti; but its hair is not red, but olive.

THE TUCAN, OR MEXICAN SHREW, is a little larger

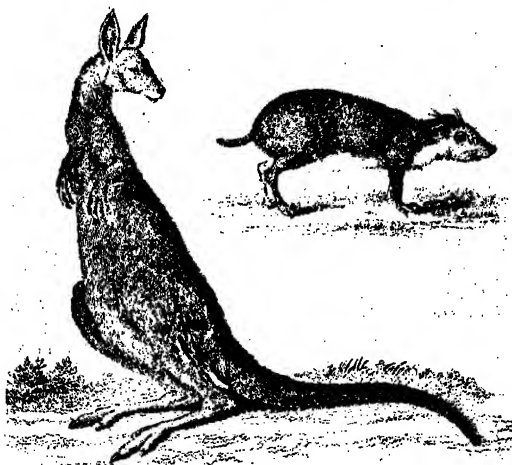
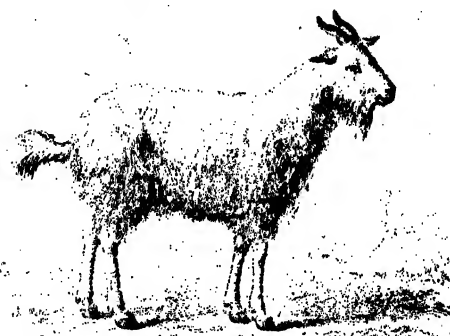
than our mole, and, like that, is fat and fleshy, with such very short legs, that its belly touches the ground. Its tail is short; its ears small and round; its eyes so very small, that they may be said to be useless; but differs from the mole in the colour of its hair, which is of a reddish hue, and by the number of toes, having only three to the fore feet, and four to those behind. It seems still farther to differ from it, by its flesh being good to eat.

THE FIELD MOUSE OF BRASIL is considerably larger than ours, being about five inches from the extremity of the snout to the insertion of the tail, which is only two inches, and, consequently, much shorter in proportion than that of the common field-mouse. Its snout is pointed, and its teeth very sharp.

THE APEREA. This animal, which is found in Brazil, is neither a rabbit nor a rat; yet it seems to partake something of both. It is about a foot long, by seven inches in circumference. The hair is of the same colour as our hares, but white upon the belly. It has also, like that animal, a slit lip, large incisive teeth, and a whisker about the mouth; but its ears are rounded, like those of a rat; the fore legs are only three inches high; those behind are longer. The aperea has got no tail; its flesh is like that of a rabbit, which it resembles in its method of living: it conceals itself in holes, but does not burrow like a rabbit, but rather retires into the cavities of the rocks and stones. It is very easily taken.

THE TAPETI seems to be a very near species, and perhaps a variety of that of the rabbit or hare. It is found at Brazil, and other parts of America. It resembles the European rabbit in figure, and the hare in size and colour; its ears very long, and of the same shape; its hair is red on the forehead, and whitish on the throat; some have a circle of hair round the neck: they are all white on the throat, breast, and belly; they have black eyes, and whiskers like the rabbit, but have no tail. The tapeti resembles the hare in its method of living, fecundity, and the quality of its flesh, which is excellent food. It lives in the fields, or woods, like the hare, and does not burrow like the rabbit.

THE JUDA GOATS are considered by our authors as only varieties of the common goat.



1. Buck of India

1. Buck of India - 2. Goat of India - 3. Thouche - 4. Kangaroo.

THE KANGUROO is one of the latest discoveries in the history of quadrupeds. It is a native of New Holland and resembles most the animals of the jerboa kind, but is considerably larger, as it frequently is found to weigh upwards of eighty or ninety pounds. There are other circumstances in which it differs from these animals. The snout of the jerboa is short and round, that of the kangaroo long and slender; the teeth also entirely differ; for as the jerboa has but two cutting teeth in each jaw, making four in all, this animal, besides its cutting teeth, has four canine teeth also in the upper jaw. The head, neck, and shoulders, are very small in proportion to the other parts of the body; its tail is nearly as long as the body, thick near the rump, and tapering towards the end; the skin is covered with a short fur, excepting the head and the ears, which bear a slight resemblance to those of the hare. We are told, however, from the formation of its stomach, to what class of quadrupeds it belongs; from its eating grass, which it has been seen to do, one would be apt to rank it among the ruminant animals; but from the canine teeth, which it is found to have, we may, on the other hand, suppose it to bear some relation to the carnivorous. Upon the whole, however, it can be compared with none more properly, than with animals of the jerboa kind, as its hind legs are much longer than the fore; it moves also precisely in the same manner, taking great bounds of ten or twelve feet at a time, and sometimes escaping even the fleetest greyhound, with which Mr. Banks pursued it. One of them that was killed, proved to be good food; but a second, which weighed eighty-four pounds, and was not yet come to its full growth, was found to be much inferior.

The Kangaroo, like the opossum, has a pouch for the reception of its young.

THE KANGUROO RAT. In the same country a rat has been lately discovered, exactly resembling the preceding animal. It is about the size of a rabbit, but the head is exactly that of a rat. Its hind legs are exceedingly long, and its fore legs short, like those of the kangaroo, which it also resembles in its manner of using them. It has also a pouch for the reception of its young.

After so copious a history of quadrupeds as that which has just been submitted to our readers, a very few words appear necessary to complete the natural history of that class of animals.

On one topic only we shall therefore enlarge.—It has been frequently intimated, that a material difference exists between the animals of the Old and the New Continent. While America far exceeds us in the size of its reptiles, it is far inferior in its quadruped productions. In effect, so materially different are many of them found which inhabit the New Continent, from those of the Old, that, though we have generally noted the country of the animal we have described, yet we conceived, that it might not be unsatisfactory to the reader, if we endeavoured to exhibit a synopsis of the quadrupeds which are peculiar to each Continent.—In pursuing this plan, we have made two columns; the one for Europe, Asia, and Africa: the other for America. When we have found an animal of the New Continent resembling nearly that of the Old, we have placed it opposite in the same line; and those which are common to both, we have placed in the middle, between the two columns.

Europe, Asia, and Africa. Common to all.	America.
Elephant	
Rhinoceros	
Hippopotamus	Tapir
Camel	Lama
Dromedary	Paco
Cameleopard	
Lion	Puma
Tiger	Jaguar
Panther	Cougar
Leopard	Jaguarett
Ounce	Mountain Cat
Zebra	
Horse	{ Though not originally found there, horses and asses are now plenty in America.
Ass	
Ox	{ These also are now numerous.
Buffalo	
Bison	
Sheep	{ These also are now produced in America.
Goat	
Hog	Now produced there.
	Peccary
Guinea Hog	Now produced there.
Dog	Now produced there.
	Alco
	Goschis

Europe, Asia, and Africa. Common to all.		America.
Hyæna		
Jackall		
Porcupine		Urson
		Couanda
Genet		
Civets		A species of them is said to have been found there originally.
		Now produced there.
Cat ..		
Antelope		
Guinea Stag		
Chamois		
Ibex		
Musk		
Rabbit		Now produced there.
		Tapeti
Ferret		
Rat		Now produced there.
		Aperea
Mouse		Brazilian Field Mouse.
Fat Squirrel		
Garden Squirrel		
Ichneumon		
Badger		
Sable		Pekan
Ermine		Vison
		Stinkards.
Jerboa		
Maki		
Several Species of Monkeys		Sapajou and Sagoin
		Raccoon
		Cabiai
		Tajacou
Pangolin and Phatagin		Ant-eaters
		Sloth
Rein Deer		Cariacou
		Couandou
		Agouti
		Coati
		Opossum
		Paros
		Indian Hog
		Cavy
		Armadillo
		Kanguroo
	Rat	
	Rein Deer	
	Stag	

Europe, Asia, and Africa.	Common to all.	America.
	Bear	
	Roebuck	
	Hare	
	Squirrel	
	Hedge-hog	
	Otter	
	Marinot	
	Shrew Mouse	Mexican Shrew
	Mole	
	Beaver	
	Wolf	Mexican Wolf
	Fox	
	Weasel	Tayra
	Ermine	
	Pine Weasel	
	Pole Cat	
	Lynx	
	Seal	
	Walrus	
	Roebuck	Mazame
	Elk	
	Glutton	
Pouch	Dormouse	
Desman		Oudatra.

Of the 200 species of quadrupeds which Buffon supposes to exist, he calculates, that about 90 are original inhabitants of the Old Continent, and about 70 of the New, and that 40 may be accounted common to both.

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